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1. **You can select dominantly flat or dominantly curved labial characteristics.**
2. **You can choose molds in either porcelain or plastic.**
3. **You can transpose centrals, laterals and cuspids from different sets, when required.**
4. **You can use more than one tooth color in the same denture.**
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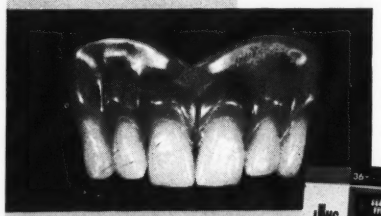

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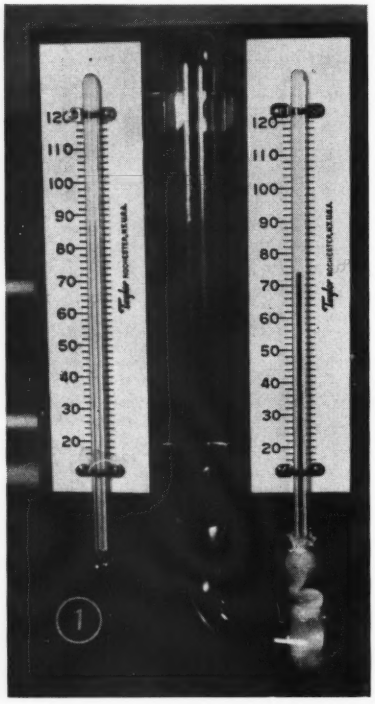
The VIBRATION TECHNIQUE

for Silicate Restorations in a Controlled Atmosphere

W. M. RINGSDORF, D.D.S., Alba, Alabama

DIGEST

Dentistry is practiced for the most part in modern surroundings and this includes air-conditioning. Operating room atmosphere can be regulated and ideal temperature and relative humidity can be attained. Silicate cements must therefore be evaluated under optimum conditions. This article represents clinical study and observation over a twelve-year period. A method of silicate cement manipulation is presented that will give lasting results if all the important steps which are described in detail are strictly followed.



1. *Mason-Form (Taylor Instrument Company) Hygrometer (8½ inches x 4½ inches). Note the dry bulb which gives room temperature. The wet bulb indicates relative humidity. The greater the difference between the wet bulb and dry bulb the less the humidity. The less the difference, the greater the humidity.*

This close-up view of hygrometer shows the following reading: Dry bulb 88° Fahrenheit and wet bulb 74° Fahrenheit. Computing the dew point from those readings results in 65.04° with a relative humidity of 51 per cent.

Control of Moisture

Temperature and humidity control allow a cold mixing slab surface to be used at any season of the year. This system makes possible mixing slab temperatures of 52° Fahrenheit and lower without condensation of moisture on the slab. The operator has three sources of moisture to control (1) oral secretions, (2) saturated breath, and (3) operating room atmosphere.

Use of Hygrometer—A hygrometer is used to calculate the dew point (Fig. 1). This instrument consists of two ordinary room temperature thermometers mounted on a wooden panel, with insulating supports and a siphon reservoir. A wick runs from the water-filled reservoir to one of the thermometers which is called the wet bulb. Evaporation of the water from the wick produces cooling of the bulb of this thermometer. The more humid the atmosphere the slower the evaporation, and the slower

2. *Correct position for reading hygrometer: perpendicular and at eye level with the fan blowing on the instrument.*

HYGROMETER READINGS AND CORRESPONDING DEW POINT CALCULATIONS

Room Temp. Deg. F.	Wet B. Deg. F.	Dew P. Deg. F.	Rel. Hum. %	Room Temp. Deg. F.	Wet B Deg. F.	Dew P. Deg. F.	Rel. Hum. %
71	58	48.12	45	75	59	47.48	37
71	59	49.88	48	75	60	49.20	40
71	60	51.64	52	75	61	50.92	44
71	61	53.40	56	75	62	52.64	47
71	62	55.16	60	75	63	54.36	51
71	63	56.92	64	75	64	56.08	54
72	58	47.50	42	76	59	46.93	34
72	59	49.25	45	76	60	48.64	38
72	60	51.00	49	76	61	50.35	41
72	61	52.75	53	76	62	52.06	44
72	62	54.50	57	76	63	53.77	48
72	63	56.25	61	76	64	55.48	51
73	58	46.90	39	77	60	48.10	35
73	59	48.64	42	77	61	49.80	39
73	60	50.38	46	77	62	51.50	42
73	61	52.12	50	77	63	53.20	45
73	62	53.86	53	77	64	54.90	48
73	63	55.60	57	77	65	56.60	52
74	59	48.05	39	78	60	47.58	33
74	60	49.78	43	78	61	49.27	36
74	61	51.51	47	78	62	50.96	39
74	62	53.24	50	78	63	52.65	43
74	63	54.97	54	78	64	54.34	46
74	64	56.70	58	78	65	56.03	49

3A. ***Chart showing hygrometer readings and dew point calculations.***

the evaporation the less difference is found between the two thermometers.

Computing the Dew Point—To arrive at the dew point observe the following procedure:

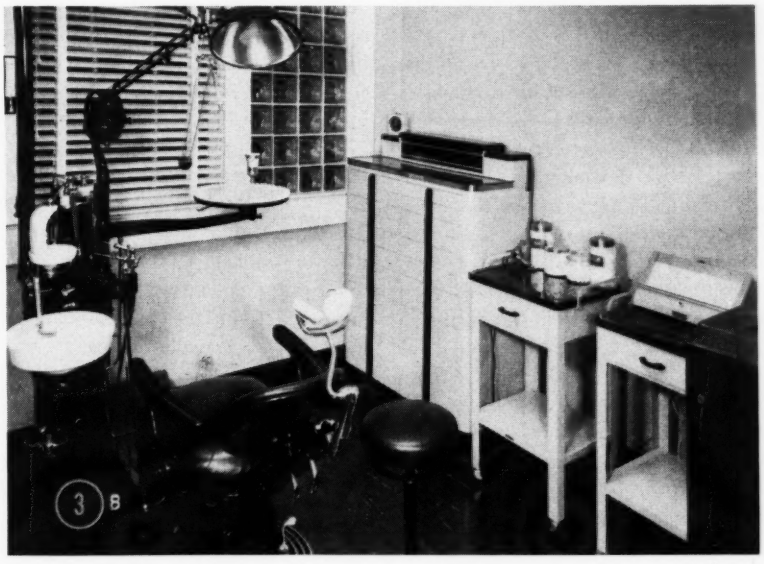
1. Carefully read the two thermometers at eye level (Fig. 2) with a fan blowing on them and the hygrometer held absolutely perpendicular.

2. As long as the temperature readings are changing, continue to observe them.

3. In approximately one or two minutes the readings will become stationary.

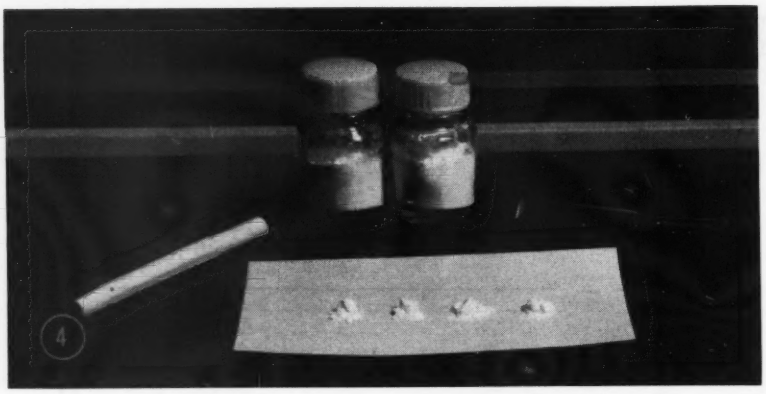
4. Allow the fan to continue to circulate the room air to prevent cold pockets forming in one part of the room. Cold air is heavy and must be forced into movement.

Simplification of Procedure—The dew point was formerly calculated with each reading. A prepared table (Fig. 3A) however, is presented which simplifies this procedure. This table has three columns of figures. The first column represents room temperature in a comfortable work-



3B. ***Operating room where this technique originated. Console model, self-contained room air-conditioner is in rear right corner. Vibrator and Transformer are to right of operating position on stool. This utility table is moved closer when using vibrator.***

Hygrometer, left front, is removed from wall to read. Stool and fan left front are not visible in this picture.



4. ***Powder, two shades, measuring stick, and paper slips. Four deep well measures of powder. Spatula used to blend shades. Blended shades protected by folding and covering paper with weight. Total weight of powder in excess of .45 gram approximately .47 gram.***

ing range between 71° Fahrenheit and 78° Fahrenheit.

Range of Temperature Readings—Corresponding to each of these room temperature readings in column one are necessary wet bulb readings from the hygrometer in column two, which produce the dew points found in column three. These temperature readings cover a range above and below those necessary to produce dew points for the technique described. For each combination of dry and wet bulb readings on the chart, the dew point has been calculated.

Additional Room Conditioning May be Necessary—With the help of the prepared table it is necessary only to read the hygrometer and scan the chart for the dew point. If a particular reading is not given on the chart, further conditioning of the room is necessary. The conditioning system, however, should be started soon enough to reach as near the ideal slab temperature of 52° Fahrenheit as possible. The dew point of the room atmosphere must be 2° below this figure in order to allow for any discrepancy that may have entered into the reading of the hygrometer.

Air-Conditioner and Reheating System Required—A central heating and cooling system is not sufficient to produce the results given in this chart. It is necessary to have a self-contained room air-conditioner plus a reheating system. An ordinary window unit or console model air-conditioner (Fig. 3B) will provide the cooling and dehumidifying, and an electric heater is sufficient for the reheating system.

Low Humidity a Necessity—It is always necessary to have a closed operating room in order to recondition the atmosphere and produce low humidity readings as soon as possible. Much moisture must be removed as the water content of the air is the real problem. Cooling the room is only part of the process of lowering the dew point. Reheating the room air so that it can lose additional moisture in passing over the cold coils of the cooling unit is also necessary in all but the hot season of the year.

Application in One General Class of Restorations

The assurance of maximum results with any silicate tooth-restoring material presupposes the employment of a proper technique by the dentist. This material is made for one general class of restorations in Class III and Class V cavities.

Improved Results with Silicate Material—The use of direct filling resins in the above classifications of cavities has convinced dentists that had similar time and effort been given to silicate manipulation far better results would have been achieved.

Former Technique Outmoded—It is time to revise the use of silicate cements. The following statement[1] is no longer an adequate evaluation:

"In evaluating silicate cements the American Dental Association specifications are not designed to test this material under optimum conditions of use but under average or even abusive conditions."

Environmental Factors in Technique

In a warm humid climate everything that happens to the manipulation of this material hastens its set or gelation: 1. An attempt to change the powder-liquid ratio given by the manufacturer without preventing faster gelation will result in failure.

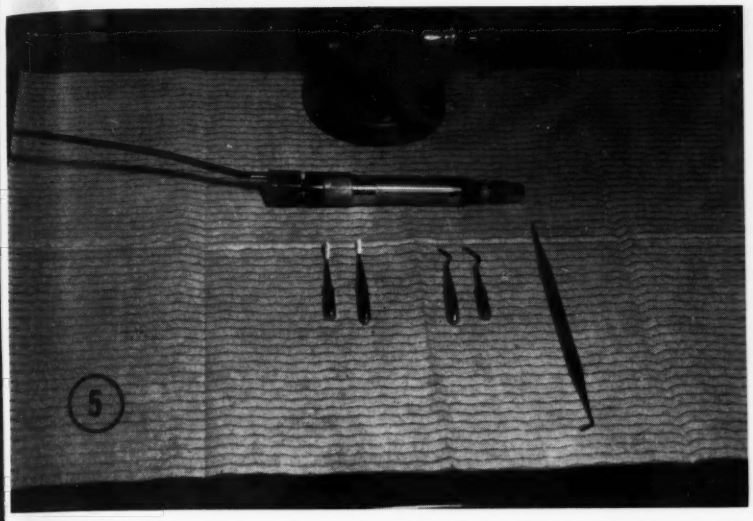
2. A cold mixing slab and short mixing time make it possible to incorporate the maximum amount of powder in a given amount of liquid and still have a usable mix:[1]

"The average amount of silicate cement powder used by 28 officers was 1.50 grams (average deviation) ± .06 gram in .4 milliliters of liquid. The standard consistency test gave a value of 1.50 grams in .4 milliliters of liquid on the same lot number of this brand of cement."

Powder Liquid Ratio—Reducing the quantities quoted to one-fourth the quantity and using more familiar terms result in the following: .375 gram of powder in .1 cubic centimeter of liquid. Three drops of liquid, using the dropper coming with the liquid, is approximately .1 cubic centimeter. Therefore, the average powder-liquid ratio used by the 28 officers was .375 gram in three drops of liquid.

Powder Content Increased—In the technique described in this paper the weight of four deep wells from the measuring stick provided by the manufacturer (Fig. 4), using two pounds per thrust into one-half bottle of powder, equals .47 gram. This provides a slight excess of .02 gram. The powder-liquid ratio is .45 gram in three drops of liquid. This is more than 20 per cent more powder than the powder-liquid ratio used in the American Dental Association Specification, No. 9, Revised.[1]

[1]Paffenbarger, George C.; Swaney, A. C.; Schoonover, I. C.; and Dickson, George: American Dental Association Specification No. 9 for Dental Silicate Cement, First Revision. Effective July 1, 1950, JADA **40**:186-193 (Feb.) 1950.



5. ***Electric vibrator used for amalgam condensation is also used for silicate condensation. Transformer. (Wright's Amalgam Vibrating Condenser manufactured by William H. Haigler, Montgomery, Alabama.) Stainless steel points used to carry and condense silicate in cavity. The only hand instrument used is one double-end plugger.***

Shrinkage of Material Reduced—Solubility and shrinkage of silicate cement is near zero with (1) a high powder-liquid ratio, (2) proper manipulation, and (3) protection from moisture for 30 minutes during the insertion.[2]

Use of Vibrating Force

An electric vibrator (Fig. 5) designed for amalgam condensation is the ideal instrument for silicate condensation. The following steps are taken:

(1) Four stainless steel flat-sided points are cut from double-ended plastic hand instruments.

(2) These points are fashioned for size by slightly narrowing two of the points. Only one size is needed to pick up, carry, place, and condense the silicate cement mortar in a cavity. This saves valuable time by removing the necessity of changing points.

(3) It is easy to pick up the denser mortar as the vibrating action of the instrument causes the mix to adhere to the flat point.

(4) The same vibrating force condenses the silicate cement in the cavity without danger of fracturing delicate enamel margins. The accessible cavity margin is well covered by overfilling the cavity.

(5) Excess cement liquid is vibrated to the surface of the restoration just as excess mercury is vibrated to the surface of a silver amalgam restoration. For this reason it is necessary to overfill the accessible margin in order that this margin may be formed by a dense silicate cement mortar.

Insertion Procedure

The rubber dam is absolutely indispensable in this procedure. To allow moisture to come in contact with the silicate at the gingival margin or the moisture-saturated breath to come in contact with this cold silicate is to invite failure. The operator's breath should be guarded and a small slip of

6A *and* **6B.** ***Cavities prepared and steel matrixes adapted and held firmly with red stick compound. A steel matrix provides its own separation.***

Do not hesitate where possible to prepare the cavities from the labial. The increased powder in mortar and vibrated insertion prevent shrinkage of the restoration and the exposed margin remains invisible to the naked eye.

[2]Davis, W. Clyde: Clinical Operative Dentistry and Therapeutics. St. Louis, The C. V. Mosby Company, 1939, Chap. 26.

paper held beneath the patient's nose to deflect his breath.

Formula for Measuring Powder—The shade should be selected before the rubber dam is applied and powder portions measured and blended on small slips of paper which are folded and covered for protection. The formula for measuring powder is the following:

1. Settle the contents of the bottle and press the powder measure deep into the powder several times to make sure the well at the end of the measure is well packed.

2. Four deep-well measures are used to three drops of liquid. This gives some excess powder to allow for different slab temperatures. The constant in the mortar mix is the liquid.

3. Count slowly to five while a drop is forming and let it fall from the dropper. This gives a fairly uniform size drop.

Stainless Steel Matrix Band—This is used for strength and is held firmly in place with compound (Figs. 6 and 6A). The matrix is not pulled over the accessible margin of the cavity on completion of the insertion, as this would disturb gelation of the densely packed restoration.

Use of Flat-sided Glass Bottle—The dew point has been arrived at previously and water 2° above the dew point has been placed in a flat-sided glass bottle (Fig. 7). These bottles are kept submerged in ice water of the same temperature and are ready for instant use. When a bottle slab is needed, one is dried and brought to the operating room wrapped in a dry towel. It is then wiped with a dry tissue and observed for a few seconds for condensation of moisture.

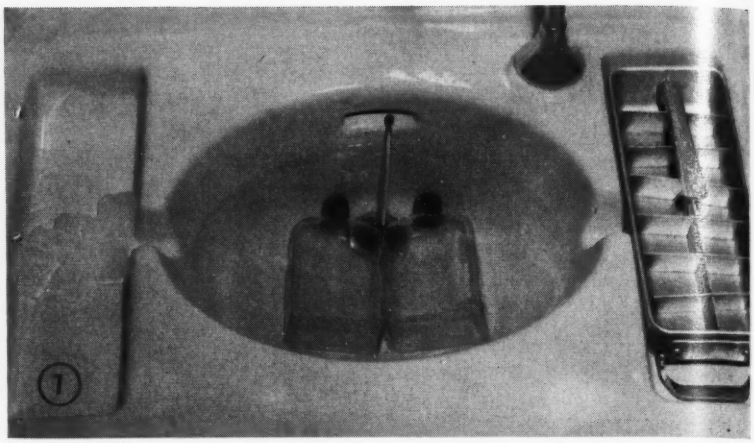
Procedural Steps—1. The powder portion is placed on the slab and segmented into three parts.

2. Three drops (Fig. 8) of cement liquid are slowly dropped between two of the powder portions. Two-thirds of the powder, or two of the segments, are pulled over the liquid so as to cover it completely (Fig. 9).

3. Allow a few seconds for the liquid to be partly absorbed by the powder before using a small circular motion to aid the liquid in permeating the first batch of powder. Too rapid mixing causes faster gelation, especially if portions of the powder are only partly moistened by the cement liquid.

4. Care is taken to keep the mortar in an area on the slab about the size of a nickel. Small portions of the remaining third of the powder are pulled over the mix and patted into it.

5. The patting action (Fig. 10) vibrates the cement liquid to the surface of the mix. While it is desirable to incorporate as much powder as possible, it must be remembered that



7. ***Water 2° Fahrenheit above the dew point of the operating room is placed in flat sided glass bottles. These are submerged in water the same temperature, preferably 52° Fahrenheit or lower.***

Note thermometer in water.

Small cubes of ice are added to the water at intervals to stabilize the temperature.

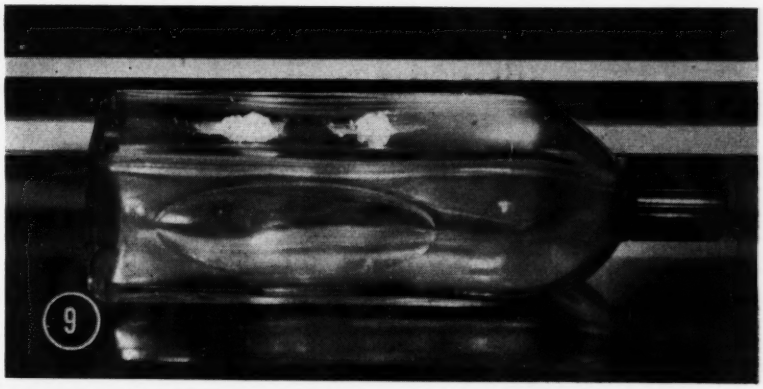
8. ***Powder portion on bottle slab divided into three segments. Liquid being dropped between two of the segments.***

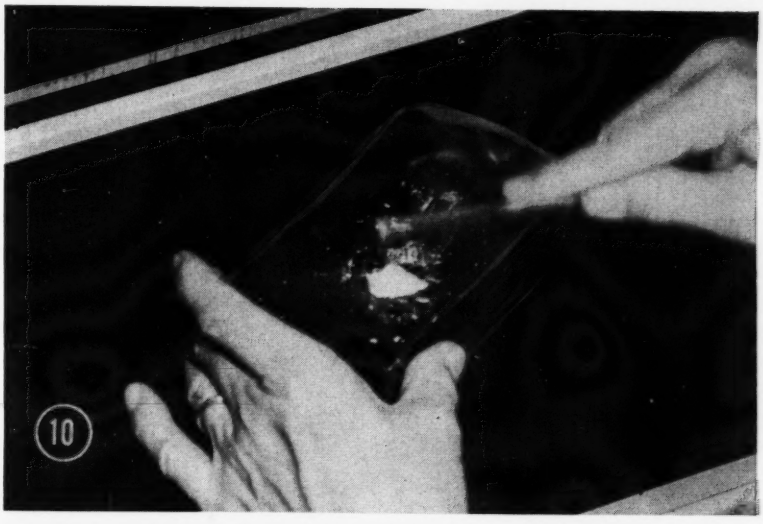
9. ***Two segments of powder covering three drops of liquid.***

Fifteen-second wait for liquid to partly permeate powder, before aiding incorporation with a light circular movement of the spatula.

10. ***The final step of spatulation is one of hammering remaining portions of the third powder segment into mix until proper consistency is attained. Proper consistency is obtained with .45 gram of powder in three drops of liquid at slab temperature of 52° Fahrenheit or lower.***

These pictures show only the motion of hammering powder into mortar. Both of these batches of mortar have jelled due to heat of floodlights used in the photography. Moisture should always be on the surface of mortar from the beginning of spatulation to the completion of insertion.





the surface of the mix must be moist at all times. Remember that there is an excess of powder and all of it cannot be incorporated.

6. The cement liquid must be protected from the atmosphere at all times. In extremely humid climates it will take up moisture from the atmosphere which hastens gelation. In dry climates it will lose moisture to the atmosphere which will retard gelation.

7. Cool the liquid and all instruments used for insertion with the cool air from the conditioner (Fig. 11).

Final Steps—1. After spatulation has been completed, small portions of the mix are picked up with the vibrator (Fig. 12). These are placed in the cavity, the vibration force causing the mix to flow as it condenses the silicate, bringing the cement liquid to the surface (Fig. 13).

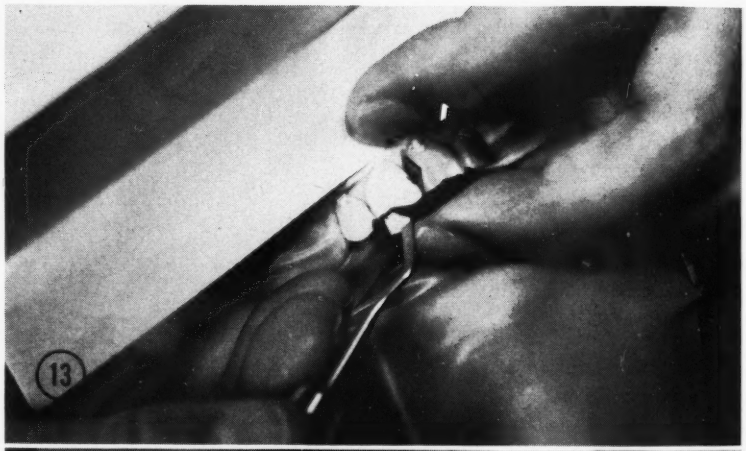
2. The process is continued until an excess of filling material completely covers the accessible margin and is well above it. Vibration force in insertion is believed to be another safeguard to the pulp tissue, as the phosphoric acid content of the mortar is vibrated to the surface, leaving a dense silicate in contact with the pulpal wall.

11. ***Cooling liquid and all instruments used for insertion with cool dry air from conditioner.***

12. ***Picking up mortar with vibrator point. The vibrating action of the instrument causes liquid to come to the surface of the mortar, thus enabling it to adhere to the point. In fact, the mortar on the point will resist most vigorous efforts to jar it loose. A wiping motion over the accessible margin removes the mortar and condenses it in the cavity. The same vibrating force continues to keep liquid on the surface of the inserted mortar until the cavity is overfilled and the accessible margin is well covered.***

The cement liquid on the surface of the mortar from spatulation through insertion is the guide for a correct insertion. Once this is lost the restoration is a failure.

A cold slab and vibrating force are absolutely necessary to carry out the steps of this technique. This is the sum and substance of this technique of silicate manipulation.



13. ***Inserting silicate into the cavity with vibration force. This force condenses the mortar in the cavity and vibrates liquid to the surface. Overfill the cavity. The same slip of paper on which the powder was blended is now used to deflect the patient's breath from the cold silicate.***

14. ***Loosen the steel matrix after the initial set so that the remaining portion of the restoration can be lubricated. The lubricant was placed on the exposed portion immediately after insertion.***

---

3. By overfilling the cavity, a dense silicate forms underneath at the margin. Lubricate the exposed surface immediately, and as soon as the initial set is completed, lubricate all other surfaces of the restoration (Fig. 14).

4. Do not disturb for thirty minutes; then remove only the rough portion of the excess (Figs. 15 and 16). Trimming and polishing is completed at a later date.

5. Slow-running diamond stones and points are used to trim the excess; these are kept well lubricated.

15. ***It is necessary to overfill the cavity as the liquid vibrated to the surface of the restoration must be well above the accessible margin of the cavity to allow for a dense mortar over this margin and surface of the finished restoration.***

6. Polishing is acomplished with finer stones and discs. Probably as many restorations are spoiled after insertion as are doomed during insertion by a careless, hurried technique.

Preventing Pulpal Irritation

One method of reducing pulpal irritation has already been mentioned and there are three more strict rules that must be followed:

(1) The dentinal tubules should be closed by sterilization. Zinc chloride 40 per cent can be used and thoroughly precipitated with potassium ferro-cyanide.[3] This has proved most satisfactory. (2) A cavity liner, and (3) a cement base should be used in all deep cavity preparations.

Extremely large pulp chambers are common in some adults and all children. An x-ray examination is the best diagnostic precaution. Silicate cements should never be placed in a youth under 16 years of age without completely cementing over the pulpal wall. If this is not possible, resort to some other type of material.

Summary

Permanent silicate cements are as possible to achieve on the equator as in a cool, dry climate if operating room temperature and humidity are controlled. The application of the principles discussed to manipulation of silicate cement should be of increasing interest to the dental profession. Years of practice have demonstrated that this branch of operative dentistry does not have to be content with a four or five-year duration, but can expect a period of service directly in proportion to the operator's adherence to the described principles of silicate manipulation.

Importance of Cold Slab—Authorities have agreed on one main principle for increasing the strength of silicate cements: that of increasing the powder content of the mix. This is possible only on a cold slab. Here-

(*Continued on page* 208)

16. ***The patient in a comfortable position amusing herself by reading. Planned use of operating time prevents this 30-minute waiting period from being nonproductive.***

The patients enjoy this period of relaxation when they are prepared in advance and know the reason for the delay. Premedication is a necessity for long appointments and aids in producing a cooperative patient.

[3]Gottlieb, Bernhard: Dental Caries, Philadelphia, Lea and Febiger, 1947, pp. 186 and 223.

ORAL ODORS: *Their Origin, Causes, and Treatment*

FRANCIS J. SAMAHA, Captain USAF (DC), Austin, Texas

DIGEST

Many patients are psychologically disturbed by bad breath. They frequently inquire of the dentist as to the cause and the measures to take to eliminate the condition. If the dentist wishes to help these patients more permanently, he must investigate the many possible causes, have an accurate knowledge of its nature, and know whether the source of the odor is physiologic or the result of some pathologic process. This article presents the possible causes of the condition and suggests specific remedies for correcting it.

General Factors Involved

A condition frequently encountered in dental practice, that of oral odors, is a condition of bad breath which is detected upon exhalation. It is also known as fetor ex ore, fetor oris, or halitosis. The disturbance may be transitory or persistent and may be classified according to local or systemic causes.

Variations in Normal Breath—It would be a mistake to believe that every unpleasant breath is abnormal or indicative of a pathologic state. The normal breath may vary considerably from a pleasant, sweetish quality to a heavy, pungent, unpleasant quality. The condition of the breath is affected by age; sex (menstrual breath in females); time of day (morning breath, evening breath); state of hunger (hunger breath); smoking habits, and dietary habits.

A Changing Characteristic—The breath odors listed are sometimes objectionable but always transient as the normal breath odor is a physiologic and changing characteristic.

Diagnosis—Clinical examination can usually ascertain whether the source is oral or systemic. A history and differential diagnosis may determine whether the cause is physiologic or pathologic in nature.

Dental and Systemic Conditions Related—The relation of dental problems to systemic problems is both direct and indirect. It is imperative that the dentist be acquainted with systemic diseases or conditions and their oral manifestations in order to advise the patient intelligently. He should confer with the patient's physician, if necessary.

Local Causes

Local oral odors occur from septic changes within the oral cavity and may arise from any one or a combination of many factors all of which initiate an odor by allowing sufficient time for bacterial action thus producing the putrefactive flora. The conditions may be the following:

1. Food stagnation around the teeth and gingiva
2. Stagnation of saliva
3. Furred tongue
4. Soft tissue infections, such as gingivitis, Vincent's infection, periodontal disease, ulcers, and malignant diseases
5. Excessive caries
6. Mouth breathing, resulting in dehydration of tissues with subsequent bleeding
7. Any decrease in salivary flow resulting in dehydrating states; for example, hypertension or emotional crises
8. Smoker's breath
9. Artificial dentures

Septic changes within the nasopharyngeal region may produce odors due to conditions such as rhinitis (producing a vile breath odor known as ozena); chronic sinusitis and postnasal drip (producing an unpleasant musty odor, especially in the morning); chronic tonsillitis (producing an odor of limberger cheese); adenoiditis (producing a fetid breath); and epistaxis (producing an odor of congealed blood).

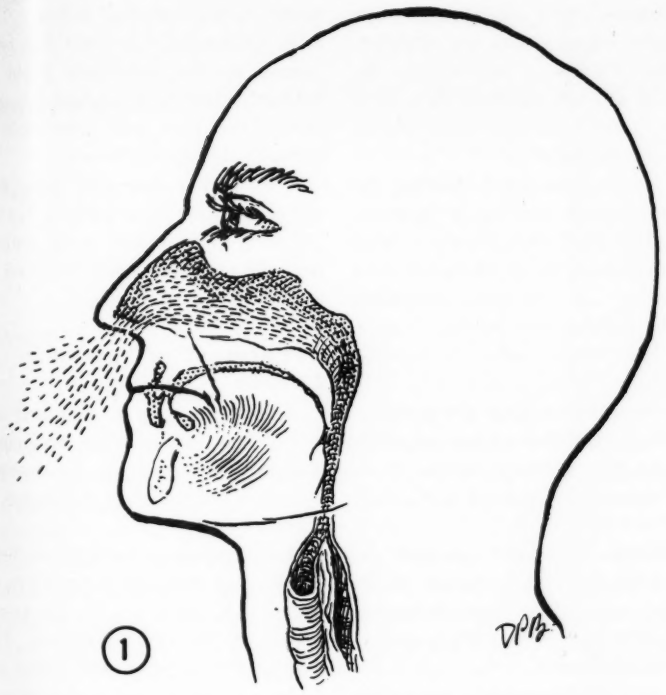
Treatment of Local Causes

A test should be given to determine whether the odor is expired from the lungs or whether it arises in the mouth. The olfaction of air from these sources can be simply tested by a commonly used procedure:

1. Have the patient blow forcibly through the nostrils with the lips tightly closed (fig. 1). This will allow air to pass from the lungs through the nasopharynx and nose but not through the oral cavity. Olfaction of this air will determine if the odor is from the lungs.

2. Have the patient close his external nares by pinching with the fingers and cease breathing momentarily with the lips closed tightly (Fig. 2). While the nose is still closed ask the patient to break the lip seal and immediately exhale gently. Olfaction of this air will determine if the source is from the mouth. If it is difficult to diagnose exactly where the source lies, it would be well to investigate the possibility of the two sources being responsible.

Self-Care Instituted—If the source of the breath odor has been determined as arising from the oral cavity because of food stagnation, stagnation of saliva, soft tissue infections,



1. ***A test for malodors from the intestinal and pulmonary tracts.***

furred tongue, or excessive caries, the odor can be readily eliminated by periodic treatment by the dentist and with a strict ritual of self-care in good oral hygiene. The following care may also be indicated:

1. Frequent daily use of an aromatic dentifrice and/or antiseptic mouth-rinse will aid in removing the putrefactive bacteria responsible for the odor for a longer period of time than will the deodorizing effect of plain or salt water rinses.

2. A daily brushing of the tongue may be necessary for those having a constantly coated tongue.

3. Reduction of smoking will help curb the problem of smoker's breath.

4. Artificial dentures must be kept absolutely clean and should be removed at night and placed in an antiseptic solution lest they acquire "denture odor." This will also allow circulation of the saliva which would be stagnated beneath the denture.

Prevention of Mouth-Breathing—The mouth-breathing problem (especially in children) should be investigated with the ultimate aim of correcting the condition, thereby preventing damage to the soft tissue of the mouth and the formation of this habit if it has not already been formed. There may be a nasal obstruction which would indicate a consultation with a physician. A malocclusion may exist which could be responsible for the condition.

Use of Mints not Recommended—Prolonged or frequent use of mints or chewing gums to maintain a more pleasant breath is definitely not recommended. This habit may lead to an increase in caries because of an increase in the sugar content in the mouth.

Topical Application of Aureomycin—Investigators have reported on the deodorizing effect of topical application of aureomycin in cases where odors arise from infected gingival tissue where bleeding, necrosis, and suppuration exist. They have stated that the odor is reduced or eliminated by this treatment, and think that it is due to the antibiotic effect of aureomycin against the putrefactive bacteria, rather than a masking effect or direct chemical action.

Chlorophyll— Although the mechanism of chlorophyll is still unknown, this agent in mouthrinses and dentifrices has been investigated and reported as remarkably reducing oral odors.

Consultation Required—If it is sus-

2. ***A test for malodors from the oral cavity.***

pected, for any possible reason, that the odor arises from the nasopharyngeal region (as in rhinitis, chronic sinusitis, or chronic tonsillitis), the patient should be referred to a physician for consultation and treatment.

Systemic Causes

Systemic mouth odors result from the excretion of aromatic substances from the blood by way of the lungs. Aromatic metabolites originating from ingested foods, products of digestion, or excretion products of cell metabolism ultimately are absorbed into the blood and are excreted by the lungs. They may occur from any one or a combination of the following conditions:

1. Infectious processes within the lungs, such as the bronchopulmonary diseases: chronic putrid bronchitis, bronchiectasis, pulmonary edema, pulmonary gangrene, lung abscesses, pulmonary tuberculosis, and empyema may produce an unmistakable stench.

2. Metabolic diseases produce characteristic mouth odors: (a) in diabetes, a fruity acetone odor is recognized due to the acetone content in the blood; (b) in cirrhosis of the liver an odor of decomposed blood is experienced; (c) in uremia, an ammoniacal odor is noticed in the expired air which, in advanced cases, becomes decidedly urinous in character; (d) and in all febrile diseases, a pronounced fetor is produced.

3. Ingestion of aromatic foods, condiments, and stimulants form products whose odors are absorbed by the blood and excreted by the lungs or salivary glands, such as from garlic, onion, cooked eggs, cheese, alcohol, and tobacco.

4. Severe conditions affecting the gastrointestinal tract or peritoneum. Gastrointestinal allergy is also a cause after ingestion of an allergenic food producing an allergic stomatitis, thereby causing bad breath.

5. The "hunger odor" is familiar but whether it arises primarily from the oral cavity or from the gastrointestinal tract has not been definitely proved. The systemic origin, however, seems to be favored rather than one of a local nature.

6. Blood dyscrasias produce an odor arising from hemorrhage of the gingiva, such as in anemia, leukemia, hemophilia, agranulocytosis, and purpura hemorrhagica.

7. Any avitaminosis, producing inflammation or infection of soft tissues in and around the mouth, will produce fetor ex ore.

8. Occupational halitosis must be considered; for example, odors arising from absorption of drugs and poisons such as mercury, lead, bismuth, phosphorus, nickel, cyanogen compounds, and hydrocyanic acid, all of which may produce a chemical stomatitis.

9. Other systemic causes may be those of salicylate poisoning which produces a fruity breath, and epilepsy which produces an odor from frothy or blood-stained saliva.

It was formerly thought that odors passed up the esophagus from the stomach, but it has been demonstrated that they only arise from the stomach during eructation.

Constipation has also been considered a cause of oral odors, but this has been disproved by some authorities although it is still believed by some to be a cause.

Treatment of Systemic Causes

When an odor is absorbed and transported in the blood and emanates from the lungs, it is sometimes extremely difficult to determine its source.

If a systemic pathologic condition is suspected, the patient should be referred to a physician for an investigation of the medical aspects. If a dual source is suspected (local and systemic) the dentist and physician should cooperate in evaluating and finally eliminating the cause.

Summary

The dentist is frequently confronted with the problem of advising and/or treating a patient with bad breath.

The origin and causes of oral odors are often obscure and perplexing. In these cases empirical treatment must be instituted. Good oral hygiene supplemented by the use of aromatic dentifrices and mouthrinses seems to be of value.

Bergstrom Air Force Base

The Vibration Technique for Silicate Restorations in a Controlled Atmosphere

(*Continued from page* 205)

tofore, no solution has been offered for maintaining a cold slab all year in any climate. This is accomplished in summer with cooling and dehumidification. With outside temperatures 90° Fahrenheit and above, slab temperatures 52° Fahrenheit and lower can be used without condensation of moisture on the slab surface. In the fall, winter, and spring seasons heat, cooling, and dehumidification are used to reduce the dew point of the operating room atmosphere.

Solubility and Shrinkage Reduced—A cold silicate mortar in contact with warm humid air is injured by the condensation of moisture. Solubility and shrinkage are absent with (1) a high powder-liquid ratio, (2) proper manipulation, and (3) protection from moisture for 30 minutes. Cavity preparation should be more open and box shaped with no beveled margins. Greater exposure allows more thorough condensation with vibration force.

More Powder Incorporated—One and one-half minutes are required to spatulate a mix on a slab 52° Fahrenheit and lower. This is due to slow chemical reaction on the cold slab. Twenty-five per cent more powder can be incorporated with this technique than that stated in the instructions of most silicate cement manufacturers. This is sufficient to provide excellent, long-lasting restorations with double the previous service time of the material.

Alba, Alabama

Approach to MOUTH RECONSTRUCTION—

Part Five

MURRAY N. RUBINSTEIN, D.D.S., New York

DIGEST

In this final installment of his serial discussion of mouth reconstruction the author presents a detailed method for successful color reproduction, an extremely important aspect of esthetic considerations in reparative procedures. The main discussion in this installment, however, is devoted to the subject of splinting which has been found to be of inestimable value in the preservation of structural patterns. Types of splints are listed and described and the method of application of each is given and thoroughly illustrated.

Suggestions for Procedure in Case Management

The corrected study casts, remounted to the true position, should accurately reproduce the conditions that are met in the mouth. Design of a treatment plan is therefore reduced to a simple procedure. Teeth below the proposed occlusal level can be built up in wax to the desired length. Areas where teeth are missing may also be built up in wax to the proposed level.

Treatment is Begun

A working model showing the correction that treatment must accomplish has been provided. From this prepared model restorations may be designed. Each tooth is individually appraised and incorporated in the plan. Concerning missing teeth, decision may readily be made as to how best to replace them. Once the plan of treatment is formulated and noted on the chart, procedure may begin.

Specific Suggestions in Treatment Planning

Some suggestions in planning restorative procedures are the following:

Full Coverage Preferred—The author prefers the use of full coverage wherever possible in reconstruction. This medium is less fraught with danger than are inlays. In the latter, recurrent caries, abrasion, or erosion may destroy a case. Because of the improvements in color control, the acrylic veneered cast gold crown is universal in its adaptability in reconstructive procedures.

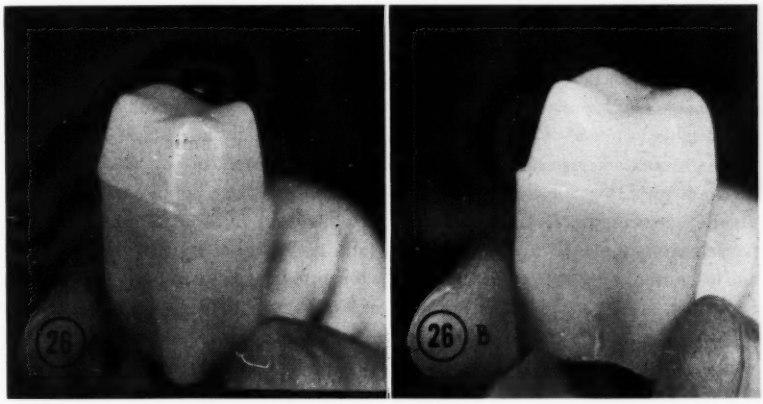
Width Provided in Buccal Shoulder—The preparation should provide a buccal shoulder (Fig. 26A) equal in width at least the size of a 557 bur to provide sufficient thickness for the acrylic. The shoulder may taper off on the proximal (Fig. 26B) slightly lingual to the proposed contact point. This will provide a contact point in metal and allow for a box large enough to avoid the display of metal in the finished crown.[28]

Color Production Improved by Plating

It has been found that a flash gold plating of the crown will facilitate better color rendition of the acrylic veneer (Fig. 27). The greatest difficulty previously was the inability to secure the desired color because, despite the use of opacifiers, the reflection of the gold alloys, which are generally of a dark color, prevailed to cause a grayish or bluish cast in the acrylic veneer. Plating now eliminates this undesirable factor.

Procedure Simple—Color plating can be obtained with any plating equipment. A wide choice of colors may be obtained, depending on the electrolyte. Those most commonly used, however, are the 24k or rose pink types. The plating color may be modified by the following variables:

[28]Cohn, L. A.: Acryic Veneered Cast Gold Crown, J. Pros. Dent. 1:1 (Jan.) 1951.



26A. ***Typical molar preparation showing buccal shoulder.***

26B. ***Proximal shoulder and lingual chamfer for finishing line.***

1. Choice of electrolyte
2. Varying time of exposure
3. Temperature of plating solution

Change in any of these three variables can produce a range of color from light to dark shades with the identical electrolyte. Experience is an aid in determining the selection of the basic shade for plating. The yellow shades usually require 24k electrolyte, and orange shades use the rose pink.

Method Used in Color Plating—1. To secure the plating, the cleaned veneer is suspended by copper wire from the cathode into the plating bath which has been previously warmed to 140° Fahrenheit.

2. A thoroughly cleaned stainless steel plate is used at the anode position.

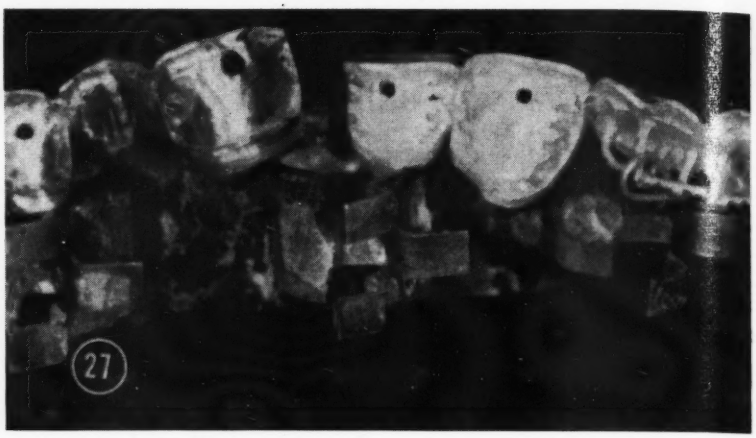
3. The machine is turned on, the veneer is agitated in the tank constantly to remove the hydrogen ions which build up and may disturb the plating process.

4. It will be necessary to observe from experience the shades that obtain at various time limits. Usually five seconds will produce the pure 24k color. If darker tone is desired, exposure should be increased.

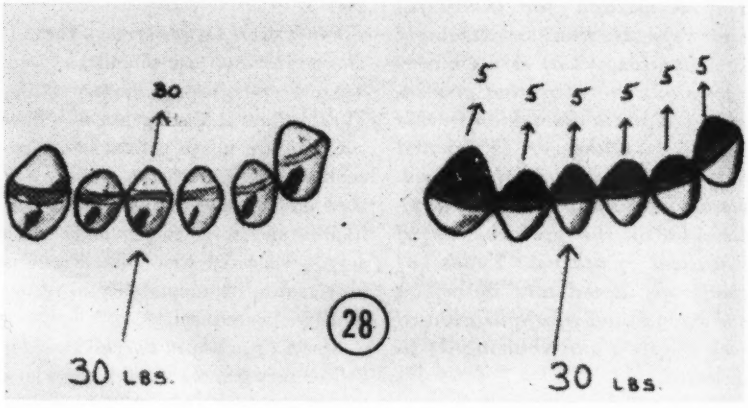
Plating Removed from Exposed Areas—Flash plating will not affect the crown or bridge in any way as only an extremely fine deposit is produced which has no appreciable displacement. Upon completion of the acrylic technique, final polishing will remove all the plating from exposed areas.

Choice of Opacifiers—The best opacifier to date seems to be a mixture of oxyphosphate cement powder and acrylic powder in equal parts by volume. The powders must be thoroughly mixed. This is thinned with monomer, painted on the warmed gold box, and permitted to air dry overnight. If time does not permit over-night drying, the use of an infrared lamp for approximately forty-five minutes may be employed to aid setting of the opacifier. This will prevent its unseating by the subsequent packing.

Care in Selection of Color—Begin with the shade guide provided by the manufacturer and improvise as necessary by combination of colors or addition of stains. As a test, sample shades are processed against prepared metal backings and tried in the mouth. Eventually, a personal shade guide may be developed with recorded data of the mix, so duplication may easily be obtained. The sample is invested in the flask with the crowns to facilitate an exact copy. Individual requirements in regard to staining or characterizing may be determined from inspection and recording of the patient's teeth before preparation. There are available various stains that may be applied when necessary. Gingival areas may be tinted if required. Check marks are simple to obtain and in many cases, particularly in male patients, aid in securing a natural appearance for the crown.



27. ***Bridge on left is unplated. The bridge on the right has been plated. Note reduction in color of the gold casting.***



28. ***The load on the splinted teeth is divided among several teeth as compared to one or two unsplinted teeth. Looking down incisally on lower anteriors. (Courtesy of Charles H. Moses, Journal of Prosthetic Dentistry 3:307, May, 1953)***

Splinting—Periodontal and Prosthetic Support

A splint is an appliance designed to mitigate the disrupting lateral stresses of mastication on individual teeth by affording the teeth mutual reciprocal support.[29]

Stabilization Provided—Clinical experience has conclusively demonstrated that splinting will stabilize teeth. It provides the means for equable division of the masticatory load through its components so that the pressure on each tooth may be brought within its physiologic toler-

[29]Fish, Wilfred E.: Paradontal Disease, London, Eyre & Spottiswood, 1952, p. 173.

ance. The diagram by Moses illustrates the theory (Fig. 28).

Structural Patterns Improved—Support derived from splinting will usually succeed in aiding the bone and periodontal membrane reorganize into favorable patterns resulting in firmer teeth. This conclusion has been amply reported in dental literature.[28,29,30,31,32,33,34]

Temporary or Permanent Construction—The operator should decide if the case requires a temporary or permanent splint. Temporary splints are indicated in the following situations:

(a) For teeth loosened by accident
(b) To stabilize teeth until more permanent construction may be undertaken
(c) To act as support for mobile teeth during periodontal treatment

Types of Splints—There are a variety of splints that may be constructed. The following are some of the types:

(1) Grassline ligature
(2) Wire ligature
(3) Acrylic
(4) Combination of wire and acrylic
(5) Removable types of acrylic and/or cast metal cusps
(6) Temporary onlay splints
(7) Permanent cast splints of (a) inlays, (b) cast crowns.

Use of Ligatures—Great aid in stabilizing teeth and securing moderate tooth movement may be obtained by use of a wire and/or silk ligatures.[33] Because floss or silk tends to become loose and foul smelling, its use is limited to cases where stabilization is required for only a few days. This would apply especially in cases of periodontitis where immobilization of the affected tooth is indicated and also for limited use in periodontal treatment.

Wire Ligatures—Wire ligatures may be employed for an extended period of time. The techniques for the application of wire ligatures are relatively simple and will render a surprising degree of support to loose teeth. In many cases, teeth under periodontal treatment will respond more favorably if splinted.

Method in Applying Splints

A continuous labial and lingual arch wire and short single interproximal loops will provide a satisfactory splint:

1. Use .010 stainless steel wire; form the labial lingual loop by passing it through the space distal to the cuspid from the labial (Fig. 29A).

2. The loop is placed loosely against the lingual surfaces of the anteriors and drawn through the space distal to the opposite cuspid, to the buccal. Here it is tied to the opposite buccal arm by twisting the two ends together loosely in clockwise movement.

3. Short individual pieces of .008 wire are used to tie the lingual arm to the buccal at each interproximal space (Fig. 29B).

4. The individual piece of wire is passed under the loop from the buccal, then passed back over the loop through to the labial.

5. The ends are twisted with the aid of a hemostat in clockwise motion and pulled labially until tightened, thus causing the loop to adjust about the teeth tightly above the cingulum and under the contact point. The ends are cut and tucked into the interproximal space out of the way (Figs. 29C and 29D).

6. Should the splint become loosened subsequently it is simple to tighten by further adjustment of the interproximal loops.

7. The ends of the large buccolingual loop are tightened, cut short and they also are tucked out of the way into the interproximal embrasure.

Cervical Retaining Loop—Should the labial lingual loop tend to slip incisally because of a conical shaped tooth, it is helpful to use a cervical retaining wire loop:

1. Using the .008-gauge wire, a loop is made at the cervical (Fig. 29E) of the cuspid or adjacent bicuspid and made tight by twisting a few times.

2. The labiolingual wire is placed between the strands of this cervical twist and the retaining wire is twisted tight to secure the large loop.

3. The ends of the cervical loop are cut short and tucked into the interproximal space.

4. If a space exists between the teeth which it is desired to maintain, the interdental space may be maintained by twisting the larger loop to take up the space.

Durable Temporary Splint—When it is planned ultimately to fabricate a fixed multiple crown splint for the anteriors after moving these teeth together properly, a more durable type of temporary splint, one that is of internal type of construction, may be used. This splint will permit keeping the teeth in the desired position for a period of time to aid in securing regeneration of bone about the repositioned teeth after which the veneers may be prepared.

Application of Internal Splint—The internal type of splint is obtained in the following manner:[35]

1. Using a small diamond wheel, cut a channel across the palatal or lingual surfaces of the anteriors at the level of the contact points and if desired, include the occlusal of the first bicuspids up to the distomarginal ridge (Fig. 30A). This channel should be 1 to 1½ millimeters deep.

2. Using a 45 inverted cone bur, undercut the channel.

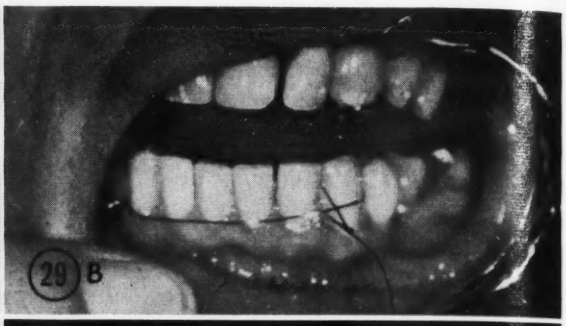
3. Form a double twisted strand of .010 wire and adapt this so that it will rest within the channel inertly. Remove the wire.

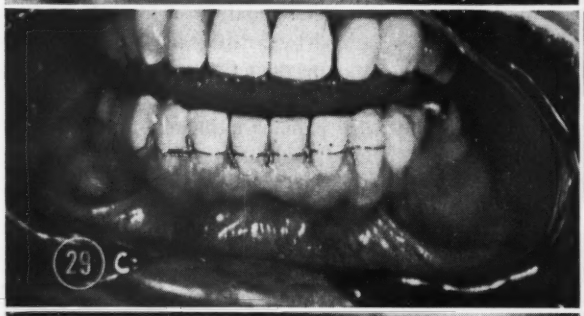
4. With the brush technique, place fast cure acrylic in the channel; replace the previously fashioned wire in position, and fill the channel slightly overfull.

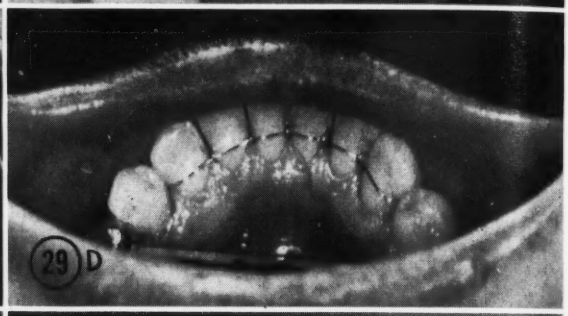
5. After permitting a thorough set of at least twenty minutes, the bite may be adjusted and the acrylic polished (Fig. 30B).

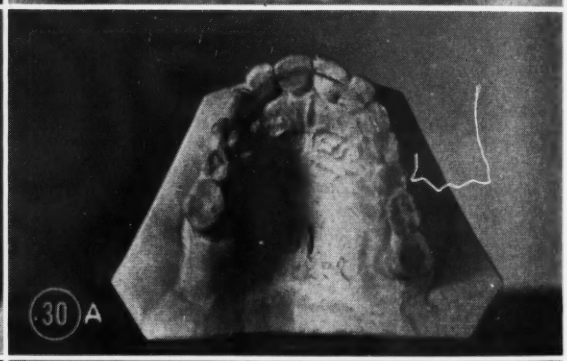
Removable Splints—These may be of temporary or permanent design. Although the author is convinced of

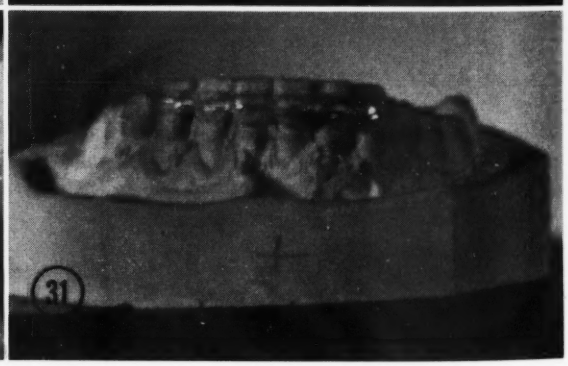
[30]Sorrin, S.: Fixed and Removable Splints, Am. J. Orthodont. & Surg. **31**:6 (June) 1945.
[31]Simring, M.: Splinting, JADA **45**:402 (Oct.) 1952.
[32]Chaiken, B. S.: Temporary Splinting in Periodontal Therapy, Alpha Omggan **48**:2:97 (Sept.) 1953.
[33]Hirshfeld, L.: Use of Wire and Silk Ligatures, JADA **41**:647 (Dec.) 1950.
[34]Orthopedic Research Group: Splints in Dental Practice, J. Pros. Dent. **3**:525 (July) 1953.
[35]Berliner, A.: Clinical Periodontology, New York, Park Press, 1953, chap. 4, p. 101.











29A. ***Labiolingual wire splint. First step, 1010 wire loop about anteriors, cuspid to cuspid.***
29B. ***Individual tie of .008 wire interproximally, binding lingual arm to buccal.***
29C. ***Completed ligature, buccal view.***
29D. ***Lingual view.***
29E. ***Cervical tie about bicuspids linked into cuspid loop to prevent slipping.***
30A. ***Internal wire splint, showing channel.***
30B. ***Finished splint in position.***
31. ***Temporary removable acrylic wire reinforced splint.***

the superiority of fixed splinting, there are many instances where, due to an economic factor, resort must be made to the removable type of splint which can be useful in extending the service of involved teeth. The continuous cast clasp is extremely helpful in teeth involved in periodontal disease (Fig. 15D). It is easy to remove for cleansing purposes and is not unsatisfactory esthetically.

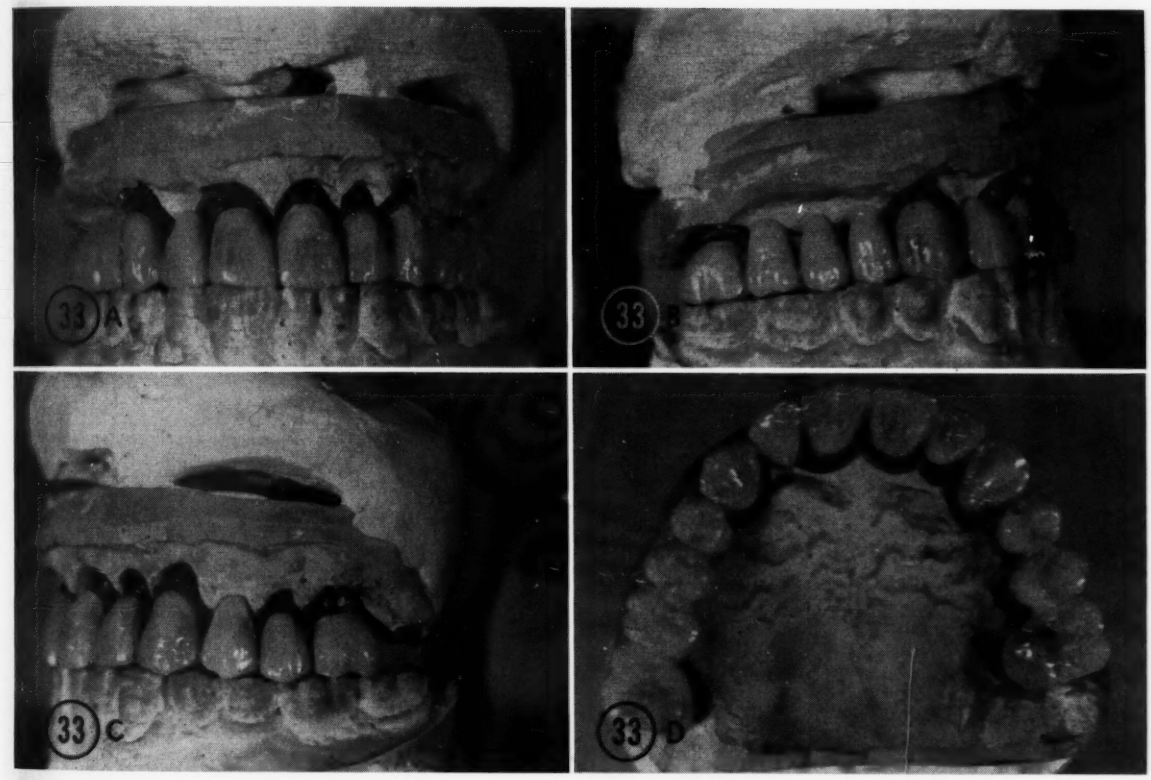
Method for Temporary Removable

Splint—If a temporary removable splint is required, the acrylic reinforced wire (21-gauge stainless wire) is suggested.[30] This splint is especially useful for small segments:

1. As an example in construction, the anterior teeth are used. Secure an accurate stone model. Tin-foil the teeth.

2. Start at the cuspid buccal and contour the wire across the cingulum; bring the wire around the opposite cuspid, contour across the labial surfaces at the same level, and bring to the starting point.

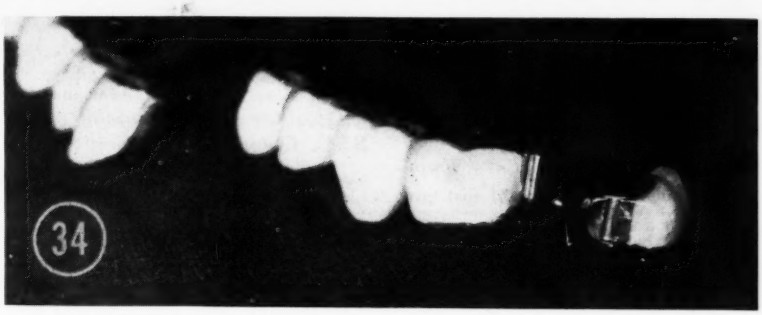
32. ***Hawley acrylic splint.***



33A. ***Temporary heat-cured acrylic splint, anterior view.***
33B. ***Right side view.***
33C. ***Left side view.***
33D. ***Palatal view.***

3. A mix of fast cure acrylic of matching color of the patient's teeth is placed over the wire across the lingual and labial surfaces. The wire at the distal of the cuspids is not covered.

4. After permitting the acrylic to set thoroughly it may be finished off and polished. This type of splint has the advantage of immobilizing the teeth and may maintain teeth that have been moved into position. It is



34. ***Prefabricated rest.***

not irritating to lips and tongue and is acceptable esthetically.

Hawley Acrylic Splint—This splint (Fig. 32) is valuable as a splint and removable orthodontic appliance. The use of this device to reestablish the normal neuromuscular pattern was mentioned earlier; this should not, however, be construed as the only benefit available from its use.

Various Uses: 1. The labial wire can be employed to move teeth that have moved labially or when diastemas between teeth have been created due to faulty occlusion.

2. Elimination of the prematurities permits return to a normal occlusion. At this point manipulation of the labial wire will secure a variety of tooth movements.

3. Closing the loop will generally retrude the incisors and so tend to close the diastemas.

4. If the labial wire is made near the incisal closing, the loop will affect rotation and simple tipping.

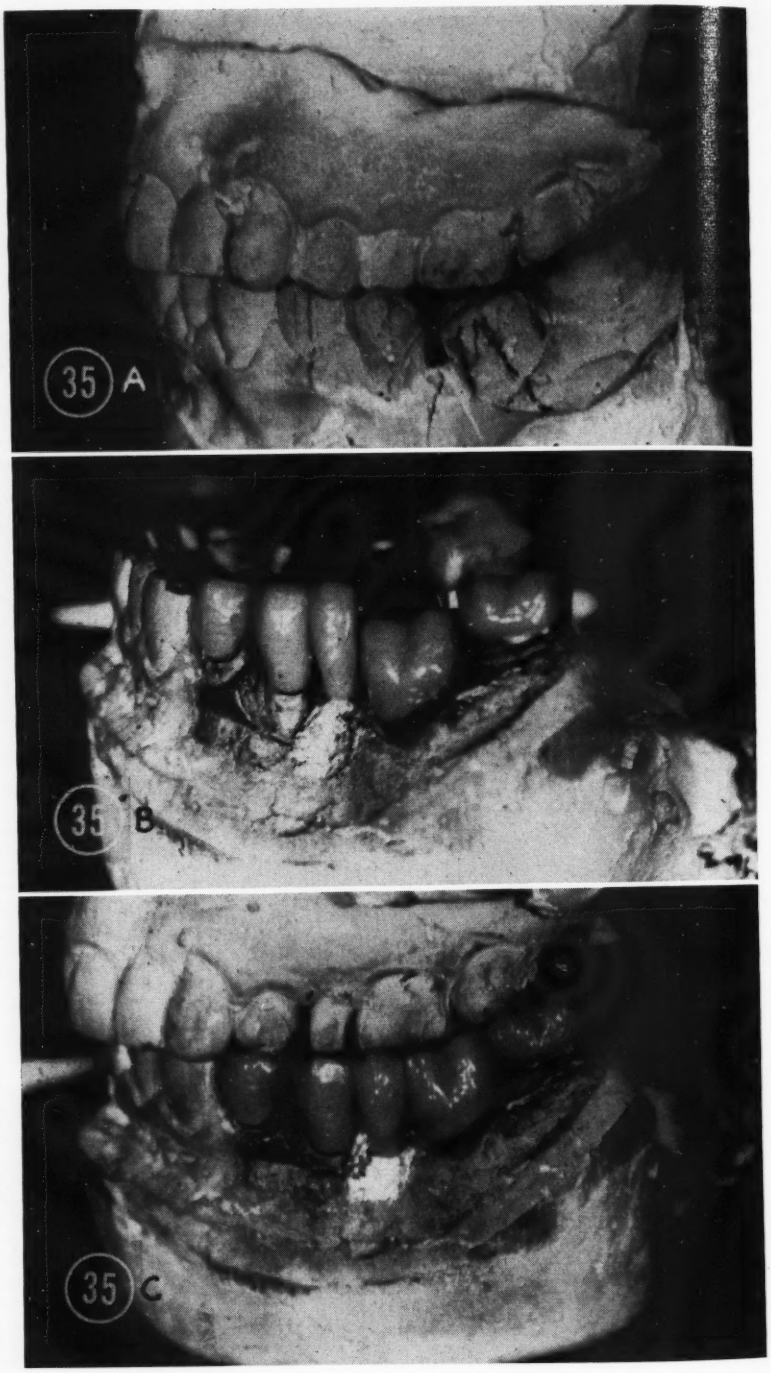
5. With the labial wire near the gingival, closing the loop will secure bodily movement of the teeth.[36]

Repositioned Teeth Maintained: When the teeth have been repositioned, the retainer will maintain the new position as long as necessary until a permanent plan of treatment can be undertaken.

Fixed Splinting

Perhaps the least troublesome and most serviceable type of fixed multiple splinting is achieved by using full coverage such as is obtained by use of cast crowns or acrylic veneered cast crowns. Full coverage is superior to the three-quarter crown or inlay type as the inlays may be jeopardized by recurrent caries or extension of buccal caries. It is the writer's opinion that there is little to be gained in the use of inlays as it generally is possible to achieve less metal display with the acrylic veneered crown.

Temporary Crown Splint—Simplified Procedure—The use of fast cure acrylic for a temporary crown splint[37] is of great advantage when it is necessary to defer completion of the permanent crowns or for the purpose of maintaining comfort for the patient once teeth have been prepared. A simplified technique is the following:



35A. *Case requiring mesial and distal prefabricated rests.*
35B. *View showing rests.*
35C. *Completed case.*

1. Before starting the preparations, take a good alginate impression of the tooth or teeth to be worked on, including at least one or two teeth adjoining to be used as stops. If the

[36]Massler, M.: The Palatal Plate, J. Dent. Children **20**:3 (third quarter) 1953.
[37]Rubinstein, M. N.: Immediate Acrylic Temporary Crown and Bridge, DENTAL DIGEST **60**:12 (Jan.) 1954.

preparations are for veneer crowns, with a sharp surgical blade cut off a little of the lingual gingival margin of the teeth to be prepared in the alginate. This additional space will provide a little more bulk in the finished acrylic pattern which can be trimmed later.

2. If the preparation is to be of the full shoulder type, no trimming is necessary. Place the impression in cold water.

3. Complete the preparations.

4. Sterilize the teeth in the usual manner and lubricate the teeth.

5. Prepare a thin mix of the fast cure acrylic material. To hasten setting time, rinse the impression previously taken in hot water and dry thoroughly.

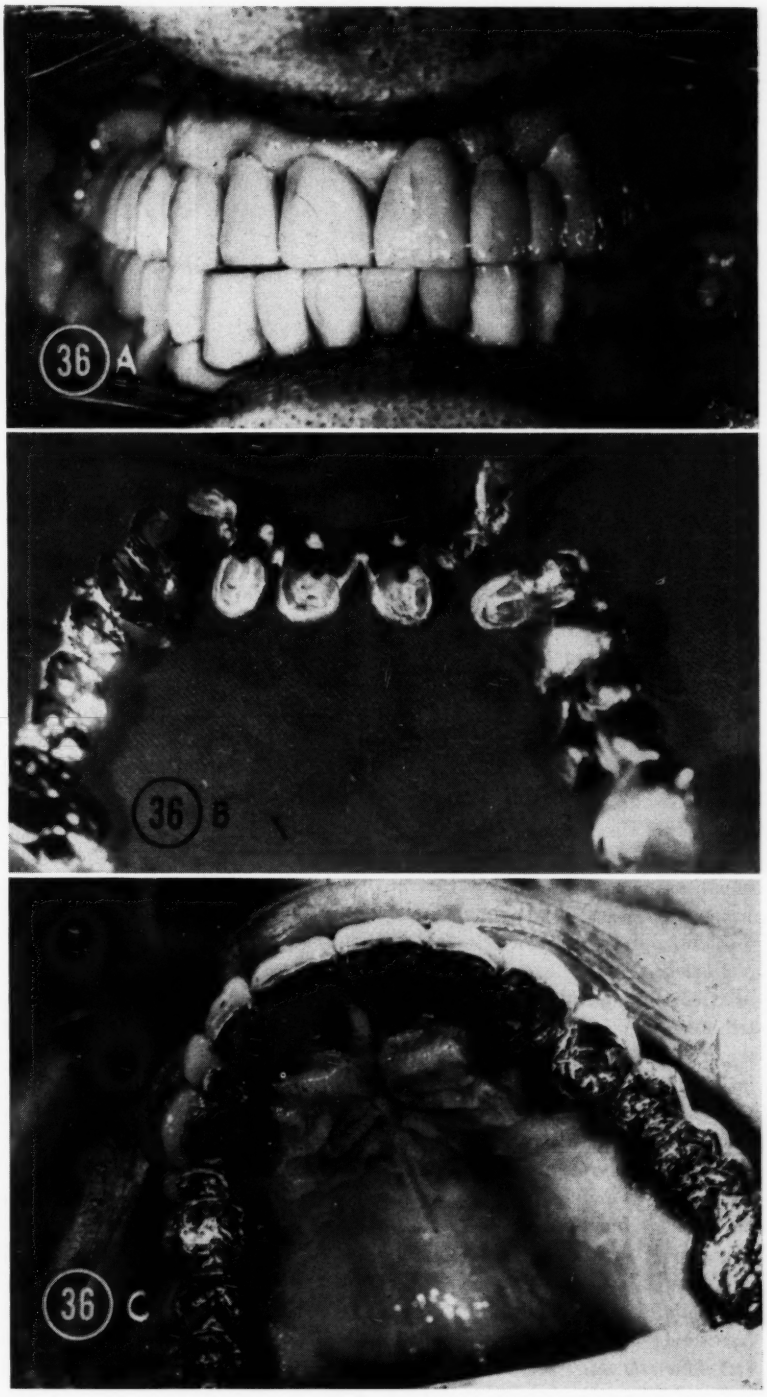
6. Have the patient rinse the mouth with warm water. Place the soft acrylic material in the impression at the site of the teeth prepared and force the impression into position. Hold in position about five to seven minutes.

7. Remove the impression. The acrylic pattern may come out with the impression or may be in position on the teeth. Tease the pattern out in either case and trim the gingival acceptably, then polish.

8. Cementing may now be done with a temporary cementing medium such as Wondrpak®, mixed with a little vaseline. Usually the temporary acrylic restorations can be removed easily and replaced exactly, as often as necessary, with no additional cement needed.

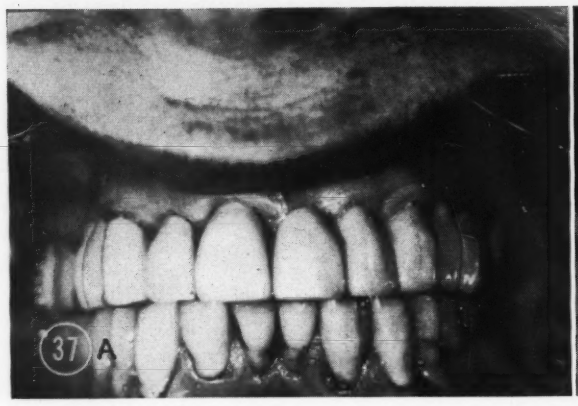
9. If the case planned is for extensive restoration, make preparations two or more at a time as preferred until the entire case is completed.

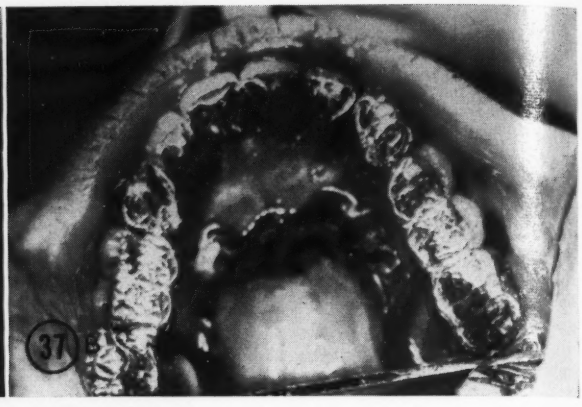
Temporary Splint: Heat-cured Type—If it is expected that a long time will intervene before final completion of the case, it may be desirable to make a more acceptable temporary splint of the heat-cured type. In this type some idea of the finished case can also be planned. A complete wax-up of the teeth individually, then joined two at a time, will afford a test of parallelism. These pairs may then be waxed together and tried on the model. This should be continued until all wax crowns are joined as required and tried for fit. The wax pattern is flasked in a large flask and completed as desired in acrylic (Figs. 33A, 33B, 33C, and 33D).



36A. ***Multiple splinting in service five years. Anterior view.***
36B. ***Assemblage of frame.***
36C. ***Palatal view.***

Prefabricated Precision Rests in Multiple Splinting—When a tooth is





37A. *Case of multiple splinting, including precision attachment denture.* **37B.** *Palatal view.*

too tipped to line up with the paralleled crowns, the prefabricated precision rest can be of advantage. The author treated a case involving a lower full quadrant embracing the two bicuspids and three molars. The third molar was a questionable tooth but its retention was desired for occlusal contact with the counterpart in the upper jaw. A prefabricated rest was employed. The case is functioning satisfactorily to date. Should the third molar develop difficulty, its removal will not cause loss of the splint (Figs. 34, 35A, 35B, and 35C).

Distribution of Masticatory Load—Multiple permanent splinting will distribute the masticatory load so that the forces applied to each tooth will be compatible with its physiologic tolerance. Generally the multiple splint will increase the usefulness of abutment teeth and also extend their life. Cases of multiple splinting that have been functioning for several years are shown in Figures 36A, 36B, 37A, and 37B.

Specific Factors in Successful Mouth Reconstruction

Fixed Bridge Prosthesis Preferred—Even where the case calls for a removable appliance, connecting small spans by a fixed bridge provides a stronger abutment for the appliance. Auxiliary support may be secured by an attachment placed in pontics.

Provision to Reduce Stresses—(1) Do not fail to reduce the buccolingual diameters of teeth and pontics to reduce stresses and strains so that they may be directed to a more axial direction. (2) For the same reason, avoid the use of a steep incisal guidance that must necessitate steep inclines on the posterior cusps. This will avoid the deteriorating effect on the supporting tissues that will result from the greater horizontal stress necessary to accomplish mastication.

Maximum Contact on Working Side—Endeavor to attain a balanced occlusion with the minimum requirement to ensure a maximum of contact on the working side.

Internal Precision Attachments Used Where Possible—Where the patient's economic condition permits and removable appliances are indicated, internal precision attachments should be chosen in preference to clasps as internal attachments tend to translate force axially.

Force Should be Translated Axially—Where clasps must be used on removable bridges, provide for sharply cut rests in inlays or crowns to help achieve the same translation of force axially as circumferential clasps will tend to produce horizontal loading. It may be noted that traumotogenic forces are caused by clasps, indirect retainers, and rests on teeth. Instances are numerous where clasped teeth receiving horizontal pressure too severe for the patient's tissue tolerance become loose. As opposed to this, there are many instances where mobile teeth have become firmer when the internal precision attachments have been used because of placement of force axially.

Maintenance of Patient Comfort During Treatment—Perhaps the most important aspect in undertaking extensive restorative procedures is that of trying to keep the patient from becoming tense during operative treatment. Seconal,® 1½ grains, before retiring may be recommended with an additional 1½ grains an hour before treatment. The patient's reaction to the drug will determine whether he should be accompanied to the office. This sedation will ensure relaxation during the office visit.

Final Adjustment Important—As a final precaution, all cases should be carefully adjusted before and after cementation to account for any prematurities or discrepancies that may have occurred. It has been demonstrated by experience that all cases, whether made on Gnathoscope or any other adjustable articulator, require occlusal adjustment to overcome premature contacts and other discrepancies which invariably result in processing procedures.

Summary

Success in dental reconstruction is possible for the average operator. The precepts inherent in successful reconstruction have been presented. Faithful adherence to the established principles will result in a successful outcome from these procedures.

200 *Central Park South*

Solution to Some Problems in Fabrication of the PORCELAIN JACKET CROWN

RICHARD W. KELLER, D.D.S., Chapel Hill, North Carolina

DIGEST

In teaching students the fabrication of the porcelain crown, several aspects have proved difficult. These technical difficulties, because of the time element which permits the construction of only one or two crowns in undergraduate study, continue to harass them in their practice. Some possess the ingenuity to improve their technique, but many continue to face the construction of a porcelain jacket crown with the same doubts and anxiety experienced as students. This situation may explain the enthusiasm for the plastic materials which seem to offer the average operator a chance to accomplish, with a less exacting technique, a reasonably satisfactory result. There can be no argument, however, that porcelain is still by far the superior material for this restoration. Step-by-step instructions are given for overcoming some of the difficulties encountered in this technique.

Basic Principles Observed

Authorities in this field maintain that the primary weakness in porcelain crown construction is trying to have all preparations conform to a textbook ideal. The dentist is rarely called upon to restore an ideal tooth with a porcelain crown.

The most important principles in porcelain jacket crown construction are (1) that the crown be baked to nearly equal thickness, and (2) that it have sufficient tooth structure to be supported.[1]

Anatomic Difficulties—Several cases in which the anatomy of the tooth seems to cause difficulty in the preparation are shown. In Figure 1 an upper lateral with a constricted mesiogingival region[2] is seen. Difficulty and failure in trying to cut an ideal preparation on such a tooth is often experienced. By cutting the shoulder three-fourths around the tooth, permitting the constricted area to remain shoulderless, a difficult operation is completed without violating any of the basic principles.[3]

Peg-Shaped Tooth—In Figure 2 a peg-shaped lateral can be cut with a ledge on the lingual to simulate a cingulum. This provides a seat for the crown, helping to prevent dislodgement from rotational stresses.

No Tooth Structure Removed: In this type of case, usually no tooth structure is removed from the incisal portion, thereby maintaining sufficient length without the use of a coping and resulting in a crown of improved color and still satisfying the cardinal principles.

One Shoulder Prepared: In situations where this peg-shaped tooth is in close contact with its adjacent central, a shoulder on that side only facilitates an easy but excellent preparation.[4]

Short Broad Tooth—As shown in Figure 3, a short broad tooth sometimes requires a crown. By cutting two proximal grooves and/or an incisal groove where an edge-to-edge bite is present, a satisfactory preparation can be obtained. This preparation will oppose the forces that tend toward dislodgement, the chief problem in these cases.[5] The difficulty of cutting an ideal preparation on the spear-shaped cuspid shown in Figure 4 is evident. By cutting the shoulder only on the labial and lingual a jacket of almost uniform thickness is secured. The danger of fracture under torsional stresses, if the ideal preparation is made, plus the difficulty of obtaining satisfactory color, can readily be seen in Figure 4.[6]

Difficulties Presented by Tooth Conditions

Large carious or previously restored areas on the labial, mesial or distal surfaces extending under the free margin (Fig. 5) present problems. Usually by placing the rubber dam, using a clamp similar to the S. S. White Number 212, the tissue can be adequately and safely displaced. The area is excavated and the shoulder cut either before or after insertion of the cement base. A clear view of the operating field thus simplifies a difficult situation. In those cases where the tissue cannot be displaced in this manner without damage, excavate and fill with cement, leaving this part of the preparation shoulderless.

Mottled Condition of Surface—In Figure 6 are shown teeth with a mottled condition in the incisal third. As a rule these areas are not carious; soft spots can be excavated and filled with cement. This will preserve length in the preparation and avoid a difficult situation.

Preservation of Incisal Angle Important—In these various situations preservation of the incisal angle, if sufficiently strong, is a necessity. Otherwise, a coping must be constructed for the stress will not be tolerated by unsupported porcelain.

Position of Tooth to be Crowned—

[1]LeGro, A. J.: Ceramics in Dentistry, ed. 2, Brooklyn, Dental Items of Interest Publishing Company, 1937, p. 40.

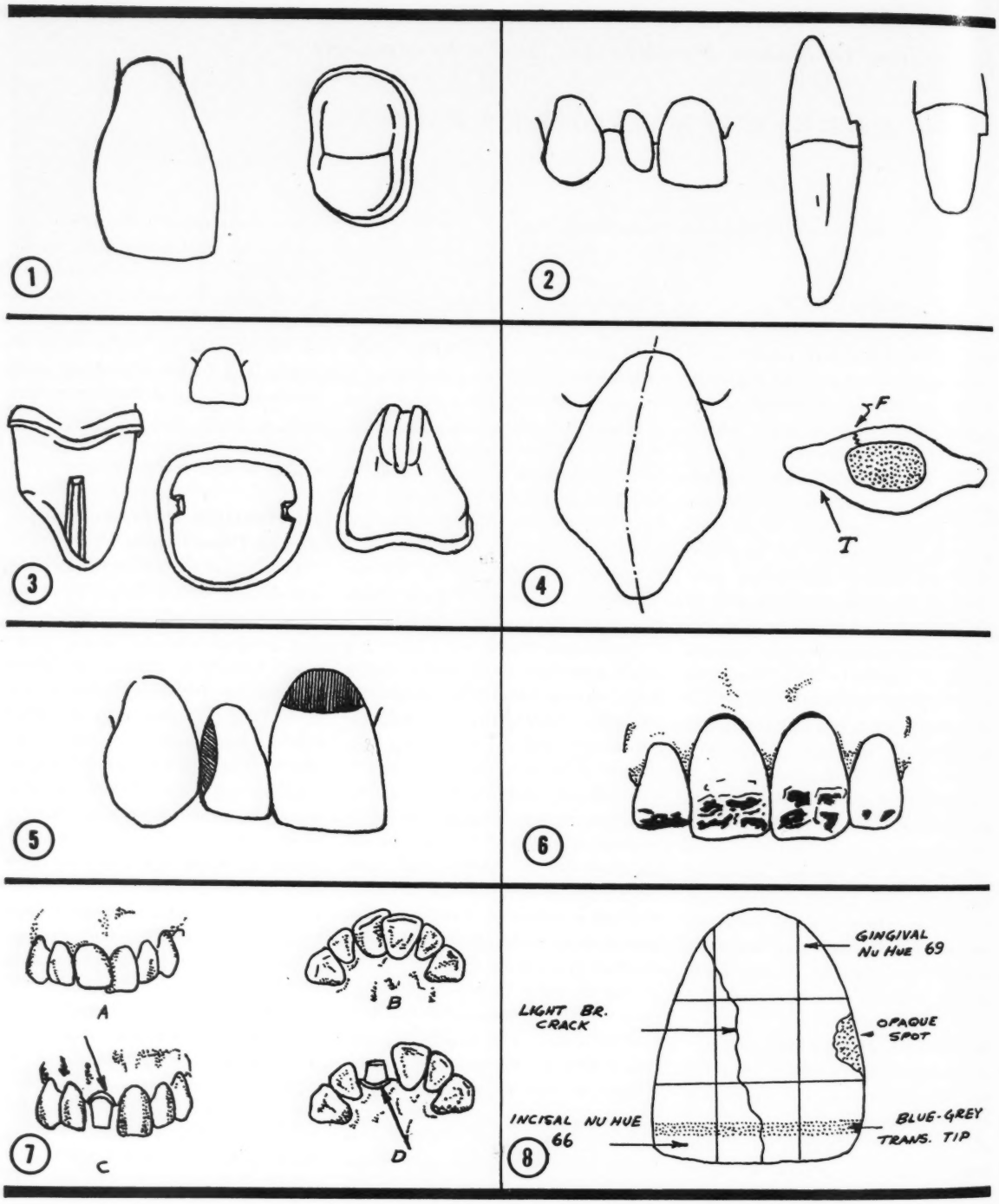
[2]Black, G. V.: Dental Anatomy, Philadelphia, The S. S. White Dental Mfg. Co., 1902, p. 30.

[3]Clark, Bruce: Requirements of the Jacket Crown, JADA **26**:358 (Mar.) 1939.

[4]Brecker, S. Charles: The Porcelain Jacket Crown, St. Louis, The C. V. Mosby Co., 1951, p. 137.

[5]Ibid., p. 139.

[6]Ibid., p. 140.



1. *Constricted mesiogingival area on this type of lateral incisor makes ideal shoulder preparation difficult.*

2. *Views of a peg-shaped lateral. Anatomy and relationship are overcome by variation in the preparation.*

3. *Short broad tooth. Edge-to-edge bite, and dislodgment factor because of short crown, are overcome by modifying the preparation.*

4. *Pear-shaped cuspid. Uneven bulk of porcelain when ideal preparation is made create stresses causing fracture.*

5. *Cervical and interproximal caries or old restorations which extend beneath free margin of tissue.*

6. *Anterior teeth showing mottled condition of incisal third.*

7. *(a) Labial view showing overlapping in upper central incisor region. (b) Lingual view. (c) Labial view, wider shoulder mesiolabially, more bulk removed. (d) Lingual view, wider shoulder distolingually, more bulk removed.*

8. *Design for tooth diagram showing adequate instruction for ceramist.*

Overlapping, rotated labio or linguoversion, abnormal spacing, are often the excuse for sacrificing sound teeth by construction of some other type of prosthesis. Incorporating two basic principles into preparations on cases of this type will allow construction of crowns with gratifying results:

(1) The first is that the occlusion of the full complement of teeth must be balanced to function properly in receiving and accomodating the porcelain restoration in its new position.

(2) The second principle is that the crown be of near equal thickness.

Second Principle Applied—It is the second principle that is of concern because it will often necessitate a modification from the ideal. For example, in the case of an overlapped central incisor as shown in Figure7, the finished preparation will have a wider shoulder distolingually and mesiolabially, and a mere semblance of a shoulder elsewhere. More tooth structure will be removed distolingually and mesiolabially.[7] All cases of this nature require excellent study casts and accurate measurement, to ensure incorporating the basic principles.

Considerations in Technique

Obtaining an Accurate Compound Impression—Success is sometimes obtained in impressions by the use of various materials which actually are still in the development stage. The operator who can easily and quickly obtain a satisfactory compound impression will at present be successful more consistently and conserve operating time.

Impression Technique—Expert operators agree that the secret of the impression technique is an accurately fitting band. This is the most important step, yet often the most neglected. The following is a step-by-step technique which will produce gratifying results:

1. Use a wire dentimeter to measure the exact diameter of the tooth at the cavo surface angle of the shoulder area.
2. Select a band; anneal the band.
3. Festoon approximately to the gingival margin; smooth festooned edges; mark the band on the labial.
4. Fill the band with soft wax and seat on the preparation in the direction of the long axis of the tooth, going slightly under the free margin.
5. Remove the band. Using the wax impression as a guide, festoon exactly to include the cavo surface angle of the shoulder, although not below it apically. Reseat the band; mark the level of free gingival margin on the band when it is seated.
6. Push out the wax, apply a light film of oil to the tooth and proceed to take a compound impression. Do not overheat the compound. In seating the compound-filled band, let the compound exude from the free end until the band is seated. Then, holding it to position, push the compound into the band without undue pressure. This prevents the band from sliding apically, engaging undercuts.
7. Chill, and remove in the direction of the long axis. If undue force is necessary in removal, heat and repeat the procedure, for an error has occurred somewhere in the procedure.

Correction of a Common Problem—The preparation and impression-taking should be completed at one sitting. A problem which commonly arises when failing to do so is proliferation of tissue in one area or another over the shoulder. This can be avoided by proper fitting of a temporary covering, using some type of periodontal packing material at the gingival area to keep the tissue off the shoulder area. Should this tissue, despite precautions, still come over the shoulder, the placement of a zinc chloride impregnated string carefully tucked between tooth and tissue and left for a few minutes prior to taking the impression, will give a satisfactory result without irreparable damage to the tissue.

Procedure in Esthestic Requirements—A simple technique advocated by successful operators is the following:

1. Draw a diagram of the tooth (Fig. 8).
2. Have the patient sit erect with the teeth at eye level of the operator in a natural light.
3. Instruct the patient to moisten the teeth. Cover all but the gingival area with a piece of white paper. Use a shade guide with a full range of colors; place a piece of paper or the thumb over the incisal portion and select the gingival color. The same is done for the incisal. Record colors on a diagram.
4. Record on the diagram any anatomic markings or stains which it is desired to reproduce (Fig. 8).
5. Note on the diagram the condition of the tooth, whether vital, nonvital, use of core, and variations in preparation from the ideal.
6. Send the porcelain crown to a capable laboratory with complete instructions and diagrams.
7. A complete and detailed technique in selection of shade and precise instruction to a capable ceramist are necessary to obtain satisfactory porcelain crowns which are a credit to all involved.

Conclusion

By being aware of the basic principles and eliminating some of the various difficulties encountered in incorporating them in crown construction as discussed in this article, the average operator should be able to approach with confidence some of the more difficult aspects in porcelain crown fabrication.

University of North Carolina,
School of Dentistry

[7] op. cit., p. 167.

The EDITOR'S Page

ONE OF the widespread morbid conditions may be termed nutritional injury. The living organism that needs constant replenishment to maintain homeostasis must depend upon the food that is ingested to maintain this balance. If the food is deficient in quality, the necessary energy to carry on efficient life processes is not available and cells and tissues that have been destroyed cannot be replaced or rebuilt. Foodstuffs that are deficient in essential vitamins and minerals cannot furnish the minute amounts of materials that are necessary for the proper functioning of the multiple enzyme systems of the body. Life events depend upon enzyme systems and they in turn look for their support to the nutrients that are taken in food.

On the chart on the opposite page (reproduced from the *British Medical Journal*) is shown the various things that are done to foods and the possible health hazards that come from these practices. One form of nutritional injury comes from taking food that has been subject to chemical treatment to increase the crop yield, enhance acceptability, help to keep from spoiling, or to aid in packaging or transport. At any place along this line of chemical addition noxious changes in the human organism can be instituted that produce clinical conditions that may be "subtle, insidious, and long-delayed."

In the masterful presentation on nutrition in the *British Medical Journal* Platt[1] mentions that the late Sir Edward Mellanby, commenting on the increasing incidence in the past 50 years of certain morbid conditions, said that he found it "difficult to avoid the conclusion that some at least of these increases in disease are due to errors in living recently introduced or greatly expanded in modern times," and that "it may be that one of these errors is the ingestion of food treated by unnatural chemical substances."

To mind come the degenerative diseases of the cardiovascular system and malignant disease. Both these conditions have increased markedly in incidence in the past 25 years. The increase in these diseases in middle and later life can possibly be traced to nutritional injury suffered years before: "There is a good deal of evidence of the occurrence of a lag between a biochemical disturbance and the appearance of pathological and clinical manifestations." Nutritional injury in the young can be the precursor of many of the diseases of later life.

Platt feels strongly that the artificial feeding of infants and the nutritional assaults in childhood prepare the biologic soil for morbid states in later life: "The feeding of the infant and young child may affect the nature, composition, and reactions to stress in later life of the extracellular matrix and connective tissue. It may be a factor in the occurrence of a number of diseases which may be identified with the sophistication of living. . . . Thus the possible effects of artificial feeding of infants may not be seen for many years and perhaps only after the tissues have been exposed to stresses or the effects of noxious agents. We may indeed be reaping in medical practice and in the postmortem room today the results of feeding in infants and young children which were prevalent 20 to 30 years ago."

Dentists have been commendably alert to the relationship between fermentable carbohydrates and caries. The direct and observable destruction of the hardest tissue in the body, enamel, that results from the degradation of sugar is of everyday concern to the dentist. The "subtle, insidious, and long-delayed" reactions in other tissues that come from nutritional injury are no less real.

The truths of nutrition and the correlation between food and optimum health will have a hard struggle to find the light in public knowledge because the powerful and vested food interests are strongly entrenched.

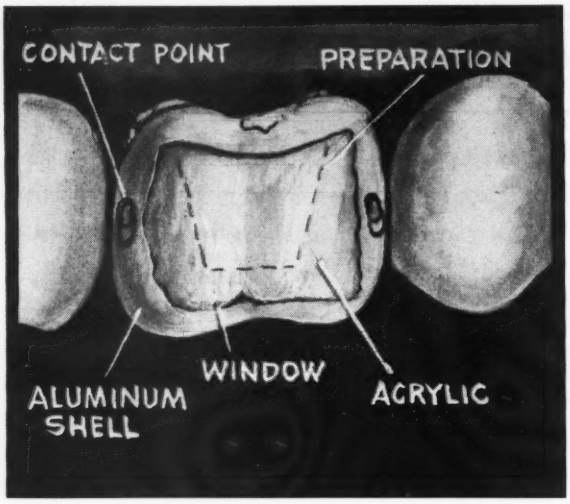
---

[1]Platt, B.S.: Human Nutrition and the Sophistication of Foods and Feeding Habits, Br. Med. J. No. **4907**:179 (January 22) 1955.

Illustrations of Various Treatments Employed at Different Stages in Food Production and Technology, with some Possible Hazards

Stage	*Purpose*	*Agent or Treatment*	*Examples*	*Possible Hazards*
Production	Increase of yield	Insecticides, fungicides, herbicides, rodenticides	D.D.T.	? Residues in cows' milk and on foodstuffs
			Organic phosphorus compounds—e.g., parathion; thiourea; arsenic compounds	Toxic residues on fruit, skin-nerve poisoning
			Salmonella rat bait	? Bacterial food-poisoning
		Antibiotics	"Aureomycin" in chick foods	—
		Hormones	Oestrogen implanted in cockerels	—
Processing	Enhanced acceptability	Refinement	Low extraction wheat-flour	Reduced dietary B-vitamin/calorie ratio
			Highly milled rice	
			Sugar	
			Salt	—
		Addition of Chemicals	Flour "improvers"	Manifested as fits in dogs fed on agenized bread
			Colouring agents—e.g., dyestuffs	Carcinogenic action of butter yellow
			Flavourings—e.g., artificial fruit essences	—
			Sweeteners—e.g., saccharin, dulcin, and P4000	Liver tumours with dulcin and kidney lesions with P4000
			Anti-oxidant, anti-browning, and anti-staling agents	—
			Emulsifiers, fat extenders, and hardening agents (hydrogenation of oils and fats)	Renal calculus with polyoxyethylenemonostearate
	Increased nutritive value (enrichment, fortification, ennoblement)	Addition of synthetic nutrients	Some B vitamins to refined cereal products	Vitamin B imbalance
			Ascorbic acid to fruit preparations	—
			Ergosterol to margarine	—
			Amino-acids—e.g., lysine to cereals flours	—
		Addition of mineral salts	Calcium carbonate and/or iron salts to wheat-flour	Mineral imbalance
			Iodides—iodates—to common salt	—
			Fluorides to drinking-water	—
		Addition of food concentrates	Fish-liver oil to margarine	—
			Skimmed-milk powder and fish meal to bread	—
			Yeast to various food preparations	—
		Fermentation	Cheese	—
			Bread	—
			Many traditional preparations—e.g., nuocmam	—
	Preservation	Chemicals: Artificial	Benzoic acid, sulphur dioxides, and nitrites	SO_2 destroys vitamin B_1, and sulphites cause haemorrhagic diathesis
		Natural	Salt	—
			Sugar	Dietary imbalance
			Vinegar	—
		Physicial means	Heating (including pasteurization)	Loss of some amino-acids by heating and in Maillard reaction
			Drying	—
			Freezing	—
			Canning and bottling	—
	Cleansing of plant, equipment, and utensils	Detergents	Quaternary ammonium compounds	Dermatitis
Storage	Packaging and transport	Newly developed wrappings, etc.	Plasticizers	
		Gas storage	For fruit, dried milk, and eggs	

From *British Medical Journal* 4907:180 (January 22) 1955.



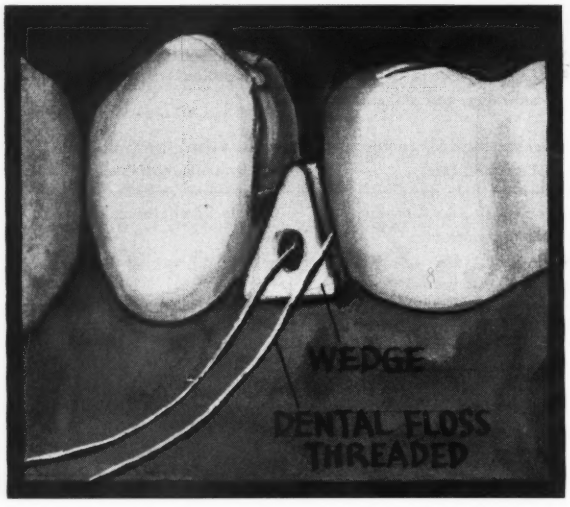
1

Clinical and Laborator

A Temporary Aluminum Crown

William K. Baris, D.D.S., Brooklyn, New York

1. Festoon an aluminum shell to correct cervical outline. Cut a window in the labial or buccal surface, leaving a gingival collar of metal. Punch holes at mesial and distal contact points. Fill the shell with acrylic mix and seat, adapting acrylic to facing contour. Allow mix to harden; remove, shape and polish. Mesial and distal perforations furnish retention for acrylic and restore contact points.

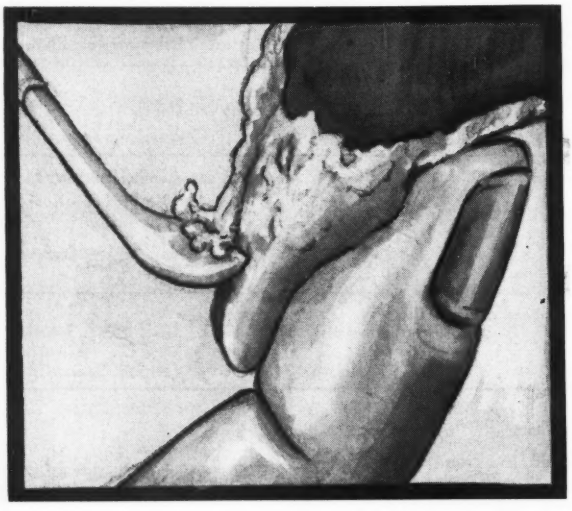


2

Easy Removal of a Plastic Gingival Wedge

William Glazer, D.D.S., South Norwalk, Connecticut

2. A hole is drilled in the plastic gingival wedge that is used for amalgam restorations. Dental floss is threaded through the hole. The wedge is easily removed by pulling the dental floss.



3

Immediate Replacement of an Anterior Tooth

Stewart M. Johnson, D.D.S., Pittsburgh, Pennsylvania

3. The required amount of quick-curing acrylic material of the desired shade is mixed and placed between approximal remaining teeth and over the palate. The palatal portion is conformed and held in place with thumb or fingers while the labial portion is carved with a plastic instrument. When cured, the replacement is removed and polished and inserted in the mouth.

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For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay $10.00 on publication.

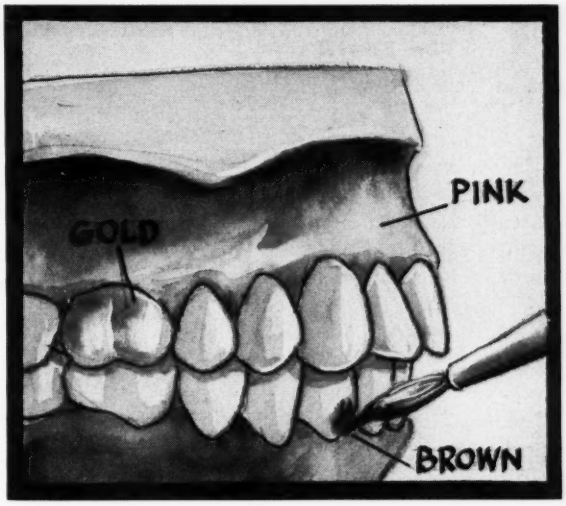
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Improving the Appearance of Study Models

Martin H. Berman, D.D.S., Floral Park, New York

4. Paint the soft tissue part of the model pink. The teeth remain white except where it is desired to show metal restorations. In such cases gold and silver paint may be used.

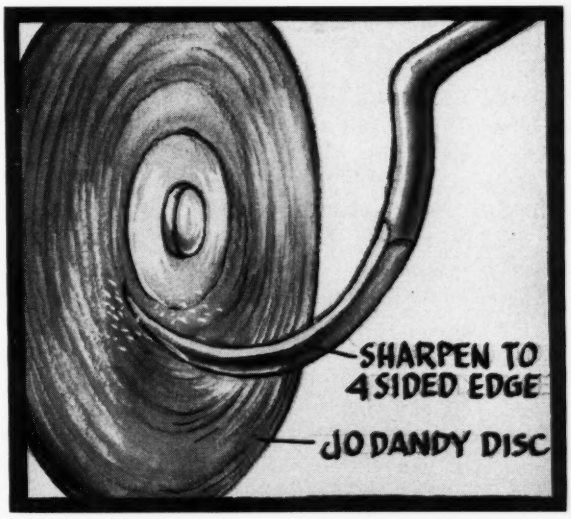


4

Sharpening Explorers

Joseph Beckner, D.D.S., Loveland, Colorado

5. A curved explorer is held against a Jo Dandy disc to make a four-edged tine. This instrument is useful in trimming the gingival and proximal margins of amalgam restorations.

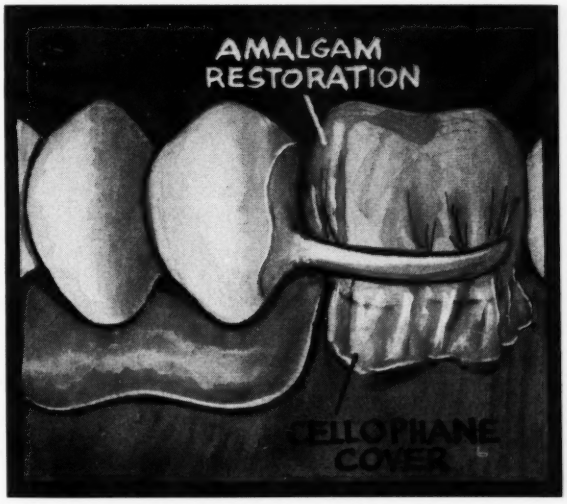


5

Clasp Protection

Ian M. Hay, D.D.S., Woonsocket, Rhode Island

6. To prevent a gold clasp from picking up mercury from a new amalgam restoration, cover the tooth and restoration with a small piece of wet cellophane.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 230 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

MEDICINE and the Biologic Sciences

The Tonsil and Adenoid Question

The new emphasis on conservation of hearing has brought a new look to the tonsil and adenoid problem. Today there is still the problem of otitic infections, sinusitis and lymphatic gland infections. However, more often now than previously, a loss of hearing is the reason for removal of tonsils and adenoids.

The tonsils may be an etiologic factor in hearing loss because of enlargement or severe infection. But they are offenders in hearing impairment not nearly so frequently as the adenoids.

In the winter many children have inflammation or infection of their ears. Inflammation is almost always accompanied by the collection of some sterile fluid in the ear (otitis media with effusion). This condition is frequently more difficult to treat and eradicate than infection. Neglect can result in partial, but permanent, loss of hearing.

The end-result of antibiotic treatment for an ear infection may be a sterilization of the infectious process with a residual otitis media with effusion. This often follows penicillin therapy. With the subsidence of pain, temperature, and discharge (if this were present) the condition is considered cured, although such is far from the truth.

Infected lymphoid tissue and undiagnosed allergic conditions are two of the principal causes of ear infections. Infected lymphoid tissue is the most frequent cause of repeated difficulty in the middle ear. Removal of a focus of infection will frequently quiet an allergic mucosa and it will not become troublesome again unless it is stimulated by another incident.

In a patient with ear problems it is essential to thoroughly remove infected lymphoid tissue. If infected tonsils are present their removal should be included, but the careful removal of the nasopharyngeal disease is the more important. This should be done at any age.

Removal should be undertaken as soon as the local condition in the nasopharynx warrants surgery. Waiting for summer is often unwarranted, for the public has become so poliomyelitis conscious that surgery is proscribed during the summer and early fall months. A cogent reason why surgery should be instituted as soon as possible is that another episode may be imminent. And this episode may be the one that will really cripple the hearing in one or both ears. Each attack is potentially a serious one. Every attack probably lays the groundwork for some loss of hearing, but one never knows which attack may leave a dramatic aftermath.

Hoople, Gordon D.: The Tonsil and Adenoid Question as Seen by the Otologist, JAMA 154:573-575 (*February* 13) 1954.

Weight Gain in Malnourished Children

Quite a large number of children with complaints of poor appetite and malnutrition are brought to the pediatrician. It is found that many of these are actually well-nourished. For these nothing is done except general directions about psychology at meal times.

The group causing some concern is the one including those who measure 10 per cent or more under the average weight and have not been able to gain. Most of the malnourished children seem to fit into the anxiety type. One group of clinicians working on this idea, decided to try a bitter-sweet sedative before meals to get both the appetizer and the quieting effect at meal time.

Elixir of nembutal appeared to be the most satisfactory for the purpose. For the smaller children ⅛ grain of nembutal sodium was given three times daily. For the older children from about seven to eight years of age upward, one teaspoon containing one-quarter grain was given three times daily.

In the series, 92.5 per cent had improved appetites and gained anywhere from one to six pounds, for an average of two pounds per person and at an average of two pounds per month. There was no apparent difference in results between the sexes.

All these children were getting adequate vitamins. It was found that when starting vitamins, the appetite may increase in underweight children, but usually levels off later. In those with good appetites and good nutrition, the increased appetite will continue.

The majority of children were of the anxiety type, small boned, nervous, jittery, sensitive, and continually under tension. They were easily upset and afraid of everything new and different. This tension destroys appetite or disturbs their metabolism and they do not get full benefit out of what they eat. Some sensitive older children may deny themselves food as a self-punishment for a guilt-feeling. Because of this type of constitutional make-up, they may continually suffer from this sense of guilt about trivial details so that their appetite is always interfered with. Even in the matter of eating and appetite, one is guided by feelings and not by logic.

The mother usually noticed the sedative effect at once, followed by an

improvement in appetite. From a hyperkinetic behavior, the child became more normal in reactions to his environment. In some, no difference was noted in the amount eaten, but the child gained anyway, apparently getting more benefit out of his food.

Those who gained the most, usually gained rapidly from the beginning, and contrariwise, those who gained poorly, continued the same rate or stopped early. Most stopped improving as they approximated their average weight.

Cioffari, Mario S.: Weight Gain through Sedation in Malnourished Children, J. Michigan M. Soc. **53**:183-184 (*February*) 1954.

Indications for Antihistamines

Certain symptoms of seasonal hay fever are relieved by the antihistamines. In about 80 per cent of instances, antihistamines will control (1) sneezing, (2) rhinorrhea and itching of the nose and eyes, and (3) redness of the eyes. If the primary symptom in hay fever is that of nasal obstruction, an antihistamine will be of little, if any value. These patients may be given acetylsalicylic acid if they are not sensitive to it.

The antihistamines are not the whole answer for seasonal hay fever. This is symptomatic treatment and once the drug is stopped, the symptoms will return. Some clinicians believe that there is a greater incidence of development of asthma following hay fever in those patients who have been given antihistamines alone. Seasonal asthma will not develop if these patients are treated with the specific pollen extracts to which they are sensitive and then with the antihistamines.

Perennial allergic rhinitis is combated with antihistamines in a manner similar to that employed with seasonal hay fever. In many asthmatic patients antihistamines are contraindicated. Every asthmatic must be carefully evaluated clinically before an antihistamine can be employed.

The antihistamines are extremely effective in urticaria, particularly in the urticaria related to serum sickness from penicillin, delayed serum sickness, reaction, food and drugs. In case of serum sickness it is important to use the antihistamine early. If the patient has not had therapy for 24 to 48 hours after the onset of the serum sickness, he is unlikely to receive satisfactory benefit with an antihistamine. Itching will perhaps be relieved somewhat, but the disease will continue much as though no drug were given. If symptoms are progressing rapidly, it is worth while to consider giving the first dose of the antihistamine intravenously and then repeating it every four to six to 12 hours depending on what antihistamine is used.

The antihistamines are of some use not only in atopic eczema but also in contact dermatitis or dermatitis characterized by itching. The drugs will not cure the patient but they will reduce the itching and make the patient much more comfortable. It is imperative that adequate dosage be employed. The dosage depends (1) on the size of the person, (2) on the individual tolerance, and (3) on the

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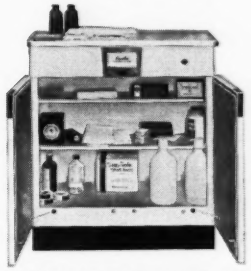

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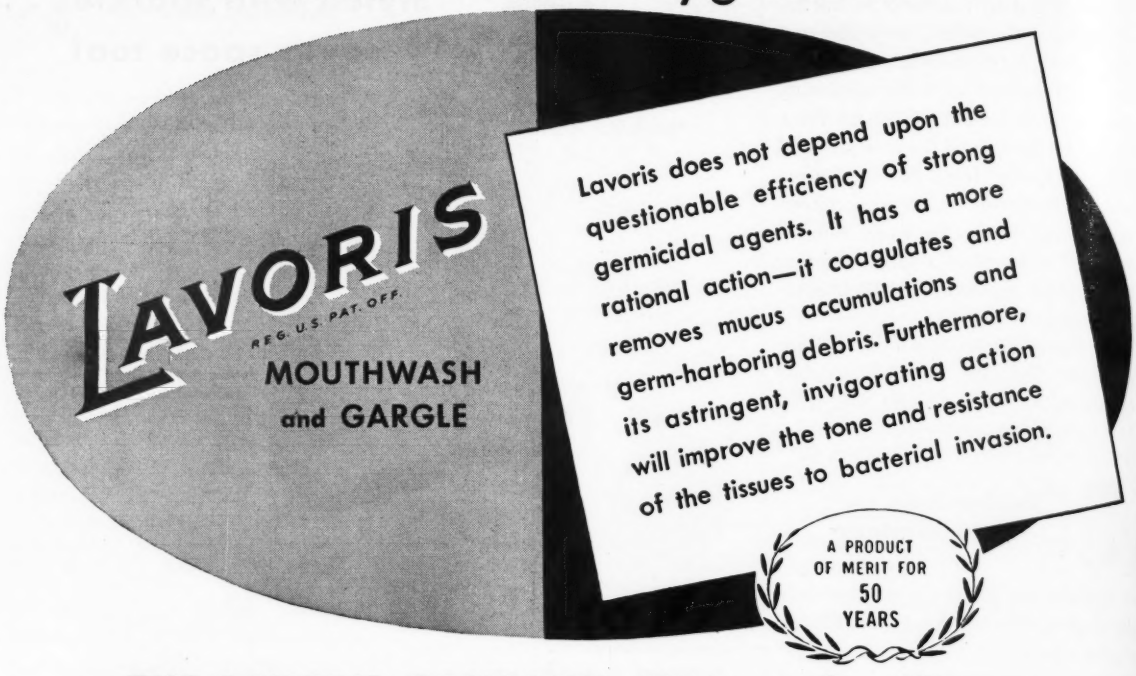
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antihistamine selected. In general, for most antihistamines, the dosage is 50 milligrams every four hours.

The antihistamines will prevent the usual symptoms associated with a food sensitivity if they are given before the patient ingests that particular food. The drugs are also useful in some cases of physical allergy. With regard to the common cold, the antihistamines will neither prevent nor shorten the duration of the complaint. They may make the patient feel better because they have an atropine effect and lessen the nasal secretions. They may also be beneficial because they all have a sedative action and the patient gets more rest and sleep.

Sheldon, John M.: The Place of Antihistamines in the Treatment of Allergic Disorders, Postgrad. Med. **14**:465-469 *(December)* 1953.

Bell's Palsy—Treatment

Bell's palsy is a common disorder that may occur in persons of any age. Little or no progress has been reported in its treatment.

The lesion has been described as inflammation of the nerve or its sheath within the facial canal or elsewhere. This familiar seventh nerve paralysis is usually of acute onset. Edema of the seventh nerve, of its sheath or of the periosteal tissues of the surrounding facial canal, from noninflammatory changes, has also been thought capable of producing sufficient compression to disrupt function.

Several plausible theories for the etiology of Bell's palsy have been advanced. Among these are the following: (1) specific infectious neuritis, (2) vascular dysfunction with secondary ischemia of the facial nerve, (3) refrigeration, (4) sub-clinical mastoid infection involving the region of the fallopian canal, and (5) congenital stenosis of the fallopian canal associated with some precipitating factor.

The majority of patients with the disorder are considered to be of the "idiopathic" type. No predisposing causes are evident in many cases. However, it is not uncommon to note a history of exposure to colds or drafts. In a few instances paralysis follows an acute infection of the naso-pharynx.

Some patients recover within a few weeks. The severer involvements usually require months for recovery.

Various methods of treatment have been used. At the present time, the treatment appears to vary between doing nothing at all to surgical intervention in every case exhibiting a negative faradic test. Recently cortisone has been used with encouraging success in some cases.

Robison, W. P., and Moss, B. F.: Treatment of Bell's Palsy, JAMA **154**:142-143 (*January* 9) 1954.

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Niacinamide	100 mg.		
Pyridoxine hydrochloride	2 mg.		
Calcium pantothenate	20 mg.		

1. Pollack, H., and Halpern, S. L.: Therapeutic Nutrition, Prepared with Collaboration of the Committee on Therapeutic Nutrition, Food and Nutrition Board, National Research Council, Baltimore, Waverly Press, 1952.

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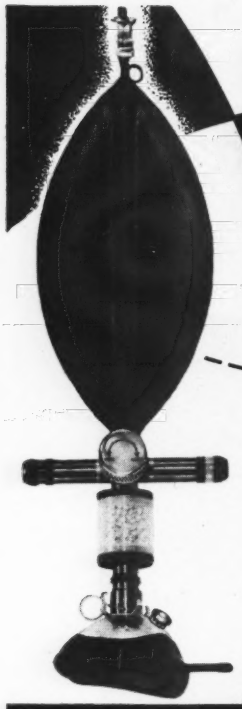

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CLINICAL AND LABORATORY SUGGESTIONS

(See pages 222 and 223)

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From: _____

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Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

$10 will be paid on publication for each suggestion that is used.

Contra-Angles

Bandits in the Hotels

For a long time I have been rankled over the banditry practiced by most hotels during dental conventions. Food, drinks, rooms are all excessively priced. Everybody, from the doorman to the chambermaid, has his hand expectantly cupped for a gratuity. A sandwich that is totally undistinguished in substance and appearance often rates a tariff of $1.25. A drink that is worth forty cents under the generous profit margin at the corner barroom costs seventy-five cents in a hotel. An ordinary room brings a daily rate of $15.00 which, in terms of a monthly rental, would be $450. One can rent a pretty fancy house for less than that.

It is good to see the secretary-editor of a dental society (Willard Ogle of Texas) bring this subject of hotel brigandry into the open:

"Opportunistic characteristics of money-mad hotel keepers are now in evidence. Just as we were about to believe it possible to enjoy certain peace-time privileges, we note one state dental society has received what may be construed as an ultimatum. The manager of their headquarters hotel has proposed certain restrictive policies for the dental convention.

"The dental association—'shall be held responsible for a minimum of three full days on all official block reservations for rooms not called for before 5:00 p.m., on day of scheduled arrival; all members with reservations at the headquarters hotel to be compelled to pay for the complete convention period; all convention programs must be approved by the headquarters hotel before printing;—and the former 10 per cent gratuity is not adequate to take care of our employees, therefore the gratuity charge

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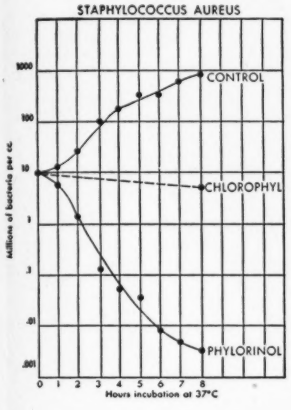

Tooth sensitivity caused by

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"There you have it, full in the face. A commercial enterprise dependent upon patronage and patronage dependent upon good public relations, has the temerity to dictate dogmatic restrictions for the conduct of guests. Such as this is contemptible. Evidently the headquarters hotel is the only one available with convention facilities and they now plan to take advantage of their position.

"There may be some justification for a hotel to require observance of certain policies. We have been called to the manager's office of more than one hotel, during an annual session, to be advised that such and such a number of members with bonafide room reservations had failed to call for their rooms, thus depriving the hotel of the income they otherwise could have realized.

"Other calls from hotel managers have had to do with members arriving early or late and departing the next day, when the reservations had been made for the duration of the convention. Hotels are in business for profit. They cannot afford to be placed at the mercy of caprice. We would not be surprised any day to receive request that convention reservations must be accompanied by payment in advance for the first day and night, said payment subject to forfeiture unless the individual for whom the room is being held duly cancels his reservation some twenty-four hours in advance.

"We have enjoyed most pleasant relations with our convention hotels in Texas. They have always placed their facilities at our disposal. Only in recent years have we paid rentals on the large ballrooms and other space. But we might experience much less embarrassment if members making room reservations would cancel same when it is found impossible to use.

"When a few men get a commodity cornered it generally is the tipoff that the sky is the limit. Additional hotel competition as well as greater respect for reservations by memory, made in

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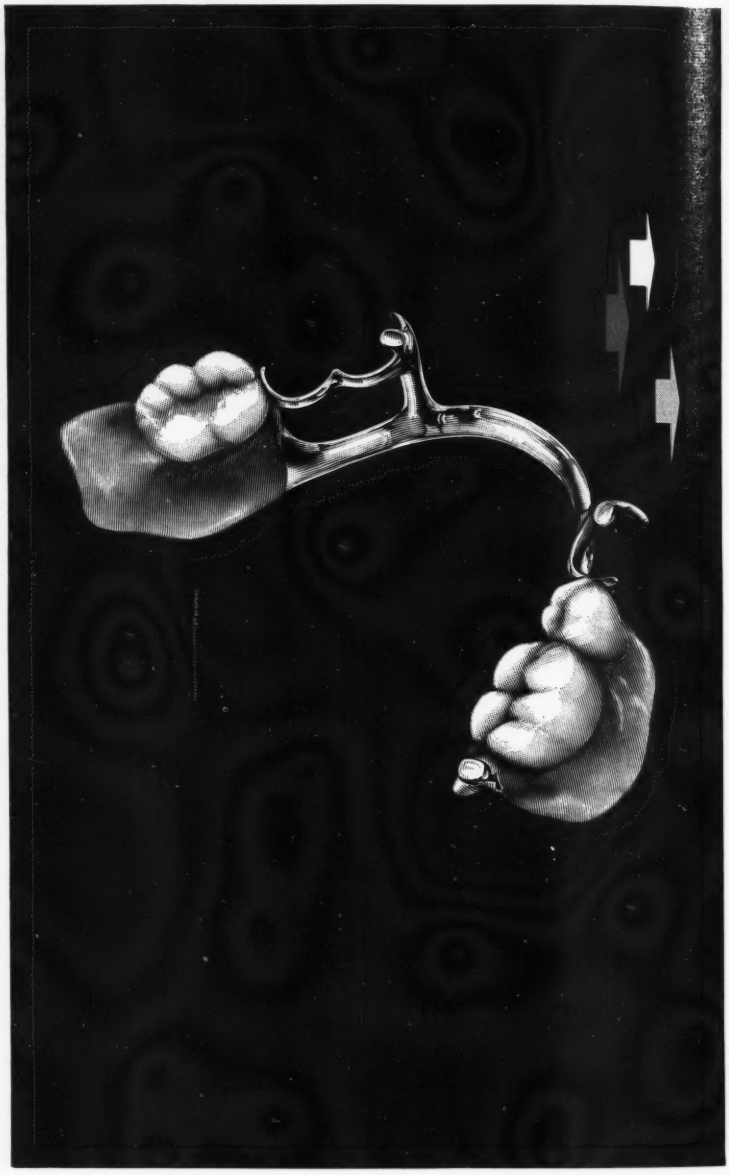
good faith, would work to the best interest of all concerned."

Convention hotels know that most of their business comes from people who charge off their expenses in their income tax returns. If the people who are paying some of these tariffs were paying exclusively out of their own funds there would be more protest over the excessive charges. As the income tax collectors tighten up more and more on entertainment and expense accounts for both corporations and individuals, hotels may expect to hear more people raising protest on overcharges.

All this public relations baloney on the theme of "Your home away from home" is lost if the treatment that one receives is discourteous and the prices are exorbitant. A snarling and supercilious clerk will promptly nullify the beautiful four-color piece of advertising that boasts of the hotel's superb accomodations. All the saliva-stimulating prose describing exotic cuisine is forgotten if under his black coat the waiter smells of perspiration as he hovers over you to take an order. The personal and the little things are what make any business a success, including the practice of dentistry.

I am all for public relations counsellors; pretty advertising color work, words alluringly strung together in fetching copy—provided the product boasted about lives up to its build-up.



Tune-up in Terminology

Dentists are not the only ones who have trouble with their terminology. Periodontosis or periodontoclasia are terms of concern to us. I learned that accountants have their own problems in such words as *revenue*, *income* and *profit*, and *earnings*.

Like the other people who have distress with simple addition and subtraction, I am afraid I never gave much thought to the jargon of accountants, whose craft is beyond my comprehension. I am sure that I never knew that those pleasant words, *revenue*, *income* and *profit*, and *earnings* had specific meanings and that they didn't simply mean that you were doing well in your business and need have no fear of immediate bankruptcy.

If you are as fiscally frustrated as I am, you will be grateful to the American Institute of Accountants for their precise definitions:

"*Revenue* results from the sale of goods and the rendering of services and is measured by the charge made to customers, clients, or tenants for goods and services furnished to them. It also includes gains from the sale or exchange of assets (other than stock in trade), interest and dividends earned on investments, and other increases in the owners' equity except those arising from capital contributions and capital adjustments.

"*Revenue*, like proceeds, is a gross concept but revenue, unlike proceeds, does not include items such as amounts received from loans, owners' investments, and collection of receivables. In the case of ordinary sales, revenue is generally stated after deducting returns, allowances, discounts, freight, and other similar items; and in the case of sales of assets other than stock in trade, it is generally stated after deducting the cost of the assets sold. The revenue for a period less the cost of goods sold, other ex-

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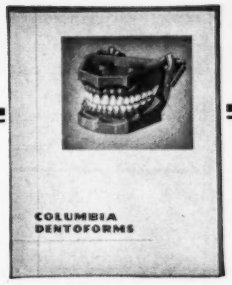

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penses, and losses will give the net results of business operations for the period. Revenue from ordinary sales or from other transactions in the ordinary course of business is sometimes described as operating revenue.

"*Income* and *profit* involve net or partially net concepts and refer to amounts resulting from the deduction from revenues, or from operating revenues, of cost of goods sold, other expenses, and losses, or some of them. The terms are often used interchangeably and are generally preceded by an appropriate qualifying adjective or term such as 'gross,' 'operating,' 'net . . . before income taxes,' and 'net.' The terms are also used in titles of statements showing results of operations, such as 'income statement' or 'statement of profit and loss,' or, sometimes, 'profit and loss account.'

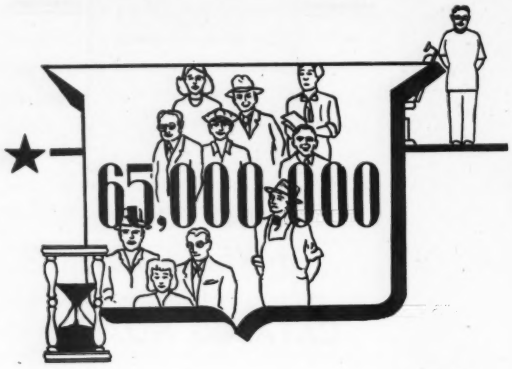
"The term *gross income* is often used as the equivalent of revenue; in public utility practice it is commonly used in referring to net income before deducting interest and other income charges. The term *gross profit* is frequently used to describe operating revenue less the cost of goods sold. The terms *operating income* or *operating profit* are generally used to denote 'gross profit' less ordinary expenses. The terms *net income* or *net profit* refer to the results of operations after deducting from revenues all related costs and expenses and all other charges and losses assigned to the period. These deductions do not include dividends or comparable withdrawals.

"The term *earnings* is not used uniformly but it is generally employed as a synonym for 'net income,' particularly over a period of years. In the singular the term is often combined with another word in the expression 'earning power,' referring to the demonstrated ability of an enterprise to earn net income."

In the past twenty-five years most dentists have put their business affairs in neater order. In the old days many dentists kept their accounts in random fashion in nickel notebooks and considered it in bad taste to send a patient a bill. At least, many of the patients considered it an insult to receive a bill.

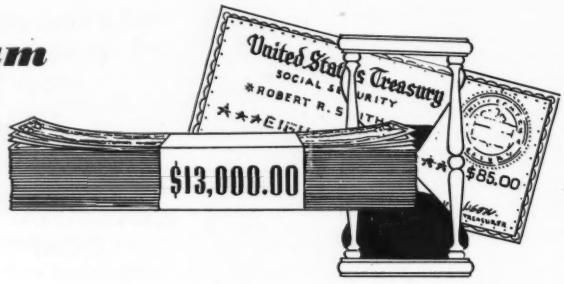
We may be distressed to admit it but dentists have found it necessary

In your ORAL HYGIENE this month



Why I am for OASI

Why I am Against OASI



No subject is of more universal interest to dentists today than Old Age Survivors Insurance. There has been much criticism of the ADA's action in excluding dentists from coverage by OASI, and quite a bit of campaigning by individual dentists and groups of dentists to force a reconsideration of this decision.

Two articles, by Doctor J. E. Pollack and Doctor George F. Kirkland, Jr. present the pro and con viewpoints on this controversial question.

Whether you personally approve or disapprove the Association's action, you will want to read both articles.

★ ★ ★

"What I Learned from Wilbur" is the first of a series of eight informal discussions of various aspects of practice management between two practitioners with divergent ideas on practice building and security. This article deals with the young dentist's choice of a pattern for success. Wilbur thinks "it might be worth our while to look carefully at our fellow practitioners. . . . We can learn much by studying them."

★ ★ ★

"Are You a Dental Broker?" asks Doctor James E. Callaway. You are if you omit the careful study of the case and the careful instructions that should precede the laboratory's fabrication of full or partial dentures. He claims that "If you have made a snap diagnosis and hasty impressions, the fee you charge the patient is a broker's commission, not a professional fee."

★ ★ ★

Doctor Charles H. Hughes believes that dentists should give more thought to "Eye Care in the Dental Office," and suggests several ways in which the dentist can protect his sight—and that of his patients.

★ ★ ★

Doctor Douglas W. Stephens, Editor, Third District Dental Journal of Los Angeles County, California, explains "What Civil Defense Means to the Dentist." It is never too soon, and may one day be too late, to assimilate this useful information.

★ ★ ★

"Everyone tells me that stocks are good things to own, and they say bonds are good, too. But frankly, and I'm ashamed to say this, I don't really know the difference between the two." John M. Sheffey, of National Association of Investment Companies, quotes the words of a young dentist and outlines the advantages and disadvantages of stocks, bonds, and insurance as investments.

to become aware of the profit motive. If they did not, they found themselves and their families doing without all of the luxuries and some of the necessities. There are still a few hypocrites circling about the dental scene who speak about "Give the service and the fee will take care of itself." Many of these dentists have themselves married rich women.

Another group of self-righteous fakirs in the dental profession speak of commerce and of business as vocations beneath them. Among these frauds are some dentists who have made or inherited their fortunes before the days of high taxes and are now living off the dividends or profits from business enterprises. Among this group there are some who preach lofty ethics and the virtues of the professional life as they turn out inferior dentistry at superior fees.

The dentist must be aware of *revenue*, *income* and *profit*, and *earnings*. To be so aware does not make him less the professional man. To deny these interests makes him a fool or a hypocrite.

—E. J. R.

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An Explanation of the Effect of Feeding Desiccated Thyroid on the Incidence of Dental Caries in the Rat

S. KIRKWOOD, Ph.D., and
E. J. RYAN, B.S., D.D.S.

Relation of Thyroid Activity to Dental Caries

Muhler and Shafer[1] have recently produced convincing experimental evidence that the feeding of desiccated thyroid has a marked anticariogenic effect in the rat. It is, in fact, as effective as the administration of sodium fluoride. They have also shown that there is an increased incidence of dental caries in rats when the level of thyroid hormone in the blood is lowered by "blocking" the thyroid with thiouracil. Their investigation leaves no doubt that thyroid activity is related in some manner to the incidence of dental caries in the adult rat.

Possible Explanation for Relationship—It has recently been postulated that the submaxillary and parotid salivary glands in the rat function to control the level of thyroid hormone in the blood stream by degrading it to iodide ion.[2,3,4,5] The iodide ion is then recycled to the thyroid gland via the saliva and the gastrointestinal tract. This explains the long-known ability of the salivary glands to concentrate iodide, and means that the concentration of iodide in the saliva will depend on the rate of thyroxine degradation, if the dietary iodide does not vary.

Effect of Stimulation of Degradative Processes in Salivary Glands—A convenient explanation of the results produced by Muhler and Shafer would be that it is the increased concentration of iodide ion in the saliva and/or the increased saliva flow due to stimulation of the degradative pro-

[1]Muhler, J. D., and Shafer, W. G.: Science **119**:687, 1954.
[2]Fawcett, D. M., and Kirkwood, S.: J. Biol. Chem. **209**:249, 1954.
[3]Kirkwood, S.: Proc. Am. Goiter Ass., in press.
[4]Fawcett, D. M., and Kirkwood, S.: Science **120**:547, 1954.
[5]Thode, H. G.; Jaimet, C. H.; and Kirkwood, S.: New Eng. J. Med. **251**:129, 1954.

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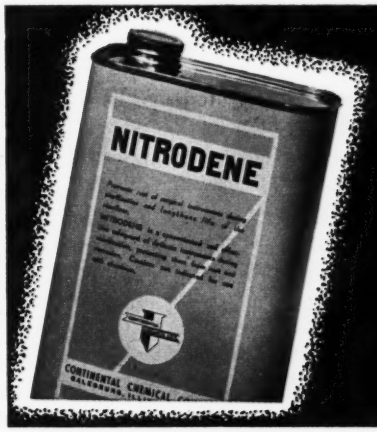

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cesses in the salivary glands, that account for the effect of feeding desiccated thyroid. The increase in the incidence of dental caries noted when thiouracil was fed, may well have been due to a decrease in the level of iodide in the saliva and decrease in the rate of saliva flow associated with a diminished rate of degradation of the thyroid hormone.

Effect of Diminution in Rate of Salivary Flow—It is well established that a diminution in the rate of salivary flow has a marked effect on the incidence of dental caries in experimental animals[6] and it is possible that iodide ion, like a variety of other substances, has an anticariogenic action when it is in solution in the saliva.

Hyperfunction of Salivary Glands Associated with Hyperthyroidism

There are many reports in the literature which indicate that hyperfunction of the salivary glands is associated with hyperthyroidism. Thus Moehlig,[7] in a review, states that obvious swelling of the salivary glands is often associated with hyperthyroidism and he quotes references to other investigators who have observed the same phenomenon. Moehlig also states that hypersalivation is often a troublesome symptom in hyperthyroidism and quotes others who have observed this also:

1. Hammerli[8] observed, in a study of 197 autopsies on goiter patients, an hypertrophy of the submaxillary salivary glands. The extent of hypertrophy was related to the size of the goiter.

2. Albright, Larson, and Deiss[9] have recently reported transient swelling of the parotid and submaxillary salivary glands in a myxedematous patient after the administration of triiodothyronine.

3. In the rat, both thyroidectomy and the administration of thiouracil or thiourea result in marked atrophy of the submaxillary salivary gland.[10,11,12] This atrophy, both in the case of thyroidectomized and thiouracil-fed rats, can be prevented by the administration of thyroid hormone.[10,12]

Cessation of Degradative Function in Submaxillary Gland—In view of the recent direct experimental demonstration that the salivary glands in the rat are concerned with the extrathyroidal metabolism of organically-bound iodine,[4] this atrophy is probably due to the cessation of the degradative function in the submaxillary gland. It would appear reasonable to assume that this would result in a diminution in the concentration of iodide ion in the saliva, along with a decreased saliva flow.

Increase in Weight of Submaxillary Gland—The feeding of desiccated thyroid has been shown to result in an

[6]Muhler, J. C., and Shafer, W. G.: J. Dental Res. **33**:346, 1954.
[7]Mochlig, R. C.: Clinics **1**:1115, 1943.
[8]Hammerli, A.: Deut. Arch. klin. Med. **132**: 111, 1920.
[9]Albright, E. C.; Larson, F. C.; and Deiss, W. P.: J. Lab. and Clin. Med. **44**:762, 1954.
[10]Leblond, C. P., and Grad, B.: Anat. Rec. **100**:750, 1948.
[11]Arvy, L.: Debray, C., and Gabe, M.: Compt. rend. soc. bio. **144**:111, 1950.
[12]Bader, R. F. W., and Kirkwood, S.: Unpublished results, McMaster University.

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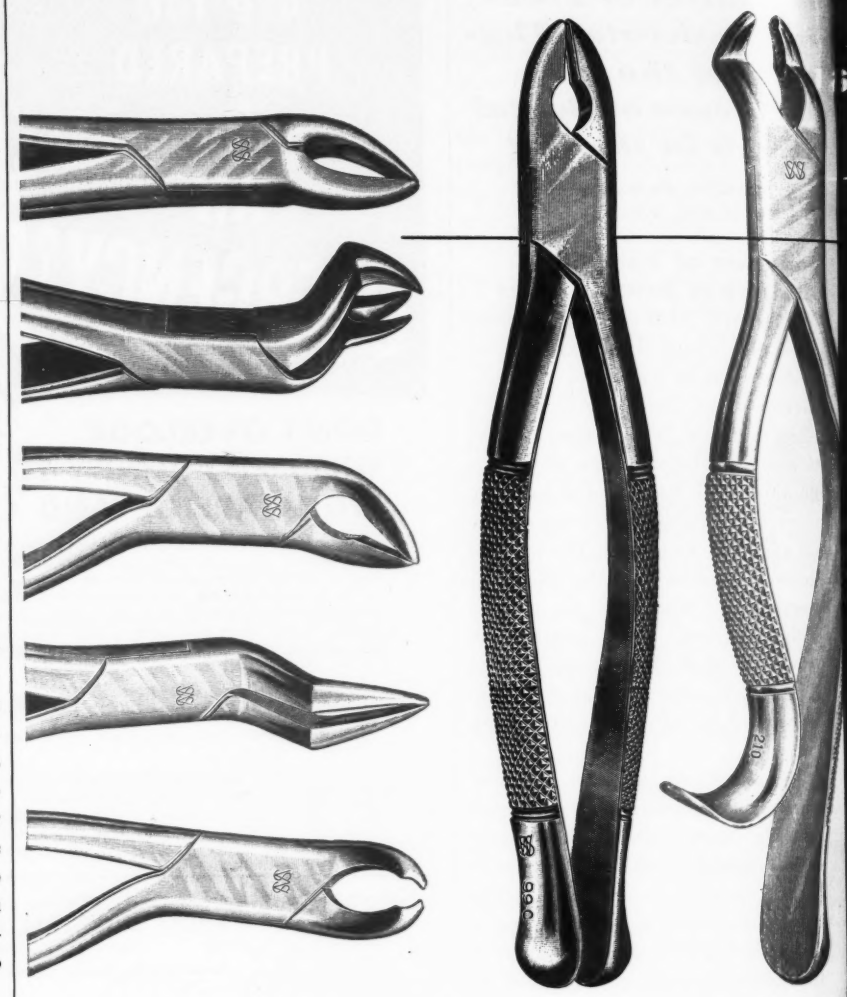

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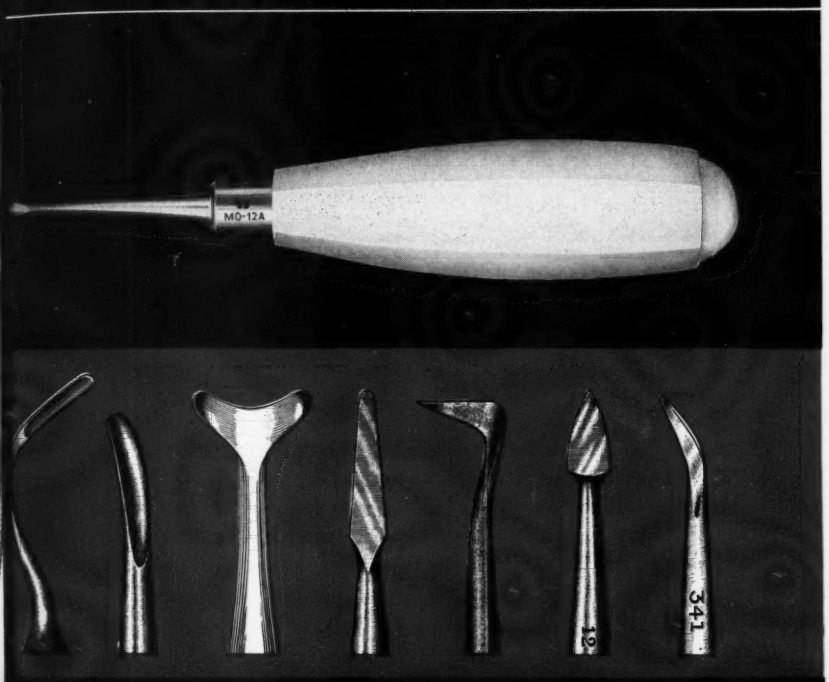

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increase in the weight of the submaxillary gland of the rat.[12] This is probably due to the increased degradation of the excess thyroid hormone, which would result in an increased concentration of iodine ion in the saliva and, perhaps to an increased flow of saliva.

Summary

There is evidence both from the clinical literature and from work on experimental animals, that there is hyperfunction of the salivary glands in hyperthyroidism and hypofunction of the salivary glands in hypothyroidism. The authors feel that the anticariogenic action of desiccated thyroid may well be due to an increased flow of saliva and/or an increased concentration of salivary iodide. The cariogenic action of the antithyroid substances is due to the reverse conditions. This concept, should it prove to be true, is of considerable theoretic and practical interest. It provides a possible explanation for the predisposition in dental caries in certain persons and opens the possibility of providing a new method for the control of caries. For these reasons the authors feel that this idea should be drawn to the attention of interested investigators.

Adapted from *Science* **121**:175 (4 February) 1955.

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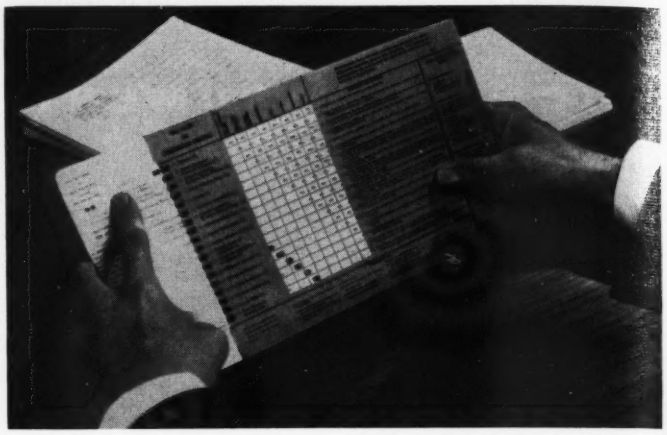

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